Historic, Archive Document

Do not assume content reflects current
scientific knowledge, policies, or practices.

United States
Department of
Agriculture

Forest Service

Tongass
National Forest

R10 - MB-332

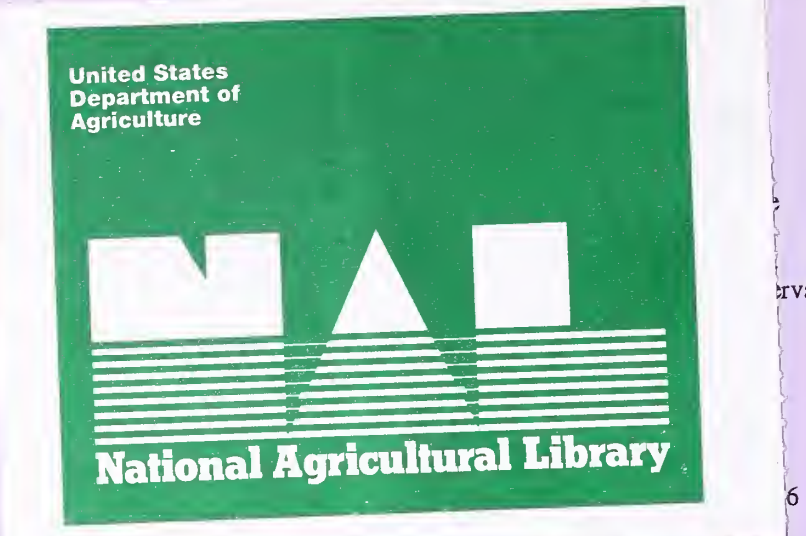
October 1996

Upper Carroll Timber Sale

Final Environmental Impact Statement

Volume II: Appendices A-K





rvation Act

6

	Draft Environmental Impact Statement
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EVC	Existing/Expected Visual Condition
FEIS	Final Environmental Impact Statement
FSH	Forest Service Handbook
FSM	Forest Service Manual
GIS	Geographic Information System
IDT	Interdisciplinary Team
KPC	Ketchikan Pulp Company
KV	Knutsen-Vandenberg Act
LTF	Log Transfer Facility
LUD	Land Use Designation
LWD	Large Woody Debris (same as LOD)
MBF	One Thousand Board Feet
MELP	Multi-Entry Layout Process
MIS	Management Indicator Species
MM	Maximum Modification
MMBF	One Million Board Feet
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NMFS	National Marine Fisheries Service
NOI	Notice of Intent
P	Primitive
PR	Partial Retention
R	Retention
RM	Roaded Modified
RN	Roaded Natural
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
SHPO	State Historic Preservation Officer
SPM	Semi-Primitive Motorized
SPNM	Semi-Primitive Nonmotorized
TLMP	Tongass Land Management Plan
TRUCS	Tongass Resource Use Cooperative Survey
TTRA	Tongass Timber Reform Act
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USFWS	United States Fish and Wildlife Service
VCU	Value Comparison Unit
VQO	Visual Quality Objective
WAA	Wildlife Analysis Area

Acknowledgments

Front cover: By Cindy Ross Barber, 1992. The design illustrates the range of interconnected issues addressed in the EIS.

Volume II

U.S. DEPT. OF AGRICULTURE
NATIONAL AGRICULTURAL LIBRARY
NOV 15 1996
CATALOGING PREP.

Appendices A-K

Appendices

A Reasons for Scheduling the Environmental Analysis of the Upper Carroll Project Area
B Units Greater than 100 Acres
C Riparian Area Prescriptions
D Biological Assessment
E Unit Crosswalk Table
F Watershed Report
G LTF Reconnaissance Report, USDC National Marine Fisheries Service Report, Alaska Timber Task Force Siting Guidelines
H Silviculture Diagnosis
I Sale Area Improvements/KV Opportunities
J Deer Availability/Deer Demand Maps
K Part 1 - Unit Cards
Part 2 - Road Cards

Appendix A

Reasons for Scheduling the Environmental Analysis of the Upper Carroll Project Area

Reasons For Scheduling The Environmental Analysis Of The Upper Carroll Project Area

KPC Long-term and Independent Timber Sale Contract Offerings

This appendix explains why the Upper Carroll Project Area is scheduled for environmental analysis at this time.

Summary

Reasons for scheduling the Upper Carroll Project Area at this time, for detailed consideration of timber harvest under the long-term timber sale contract between Ketchikan Pulp Company (KPC) and the Forest Service (Contract No. A10fs-1042) and/or under independent timber sales, may be summarized as follows:

1. The Upper Carroll Project Area contains a sufficient amount of harvestable timber volume designated as LUD III or IV, and therefore appropriate for harvest under the Tongass Land Management Plan (TLMP). Available information indicates harvest of the amount of timber being considered for this project can occur consistent with TLMP standards and guidelines and other requirements for resource protection. Analysis also indicates harvest of the amount of timber being considered can occur consistent with the proposed TLMP Revision standards and guidelines and other resource protection requirements.

2. Areas with available timber both inside and outside the designated long-term contract sale area will be necessary for harvest in order to meet timber supply requirements under the contract. The Upper Carroll Project Area is [within/outside] the designated sale area for the long-term contract [The Project Area is within the contingency area designated in the long-term contract]. The contract requires the Forest Service to look first to the designated sale area for timber to meet the contract's supply requirements before offering timber outside that area.

3 Areas with available timber both within and outside the designated sale area will also be necessary to consider for harvest in order to seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest and (2) meets the market demand from such forest for each planning cycle, pursuant to Section 101 of the Tongass Timber Reform Act (TTRA).

4 Effects on subsistence resources are projected to differ little according to which sequence these areas are subjected to harvest. Harvesting other areas on the Tongass National Forest with available timber is expected to have similar potential effects on resources, including those used for subsistence because of widespread distribution of subsistence use and other factors. Harvest of these other areas is foreseeable, in any case, over the forest planning horizon under either the existing or proposed revised TLMP.

5. Providing substantially less timber volume than required by the long-term contract with KPC and/or required to meet TLMP and TTRA Section 101 timber supply and employment objectives in order to avoid harvest in the Upper Carroll Project Area or other project areas would not meet contract requirements and is otherwise not necessary or reasonable.

6. It is reasonable to schedule harvest in the Upper Carroll Project Area at the present time rather than other areas in terms of previous harvest entry and access, level of controversy over subsistence

and other effects, and the ability to complete the National Environmental Policy Act (NEPA) process and make timber available to meet long-term contract requirements by the time it is reasonably necessary to do so. Other areas that are reasonable to consider for harvest in the near future are the subject of other project EISs that are currently ongoing or scheduled to begin soon.

More detail regarding the scheduling of the environmental analysis for the Upper Carroll Project Area is presented in this appendix in four subsections:

Ketchikan Pulp Company Contract Requirements
Southeast Alaska Timber Demand
Tongass Land Management Plan
Forest Plan Implementation

Ketchikan Pulp Company Contract Requirements

Contract Background

The current management situation consists of a valid contract between the Forest Service and Ketchikan Pulp Company (KPC), Contract Number A10fs-1042. Congress modified the contract in the Tongass Timber Reform Act (TTRA) of 1990. This contract bestows rights and obligations on both parties. One obligation for the Forest Service is to provide a supply of timber for harvest by KPC. The Forest Service must seek to provide the supply from a designated sale area within the Tongass National Forest before offering timber outside that area.

The "sale area" delineated on maps referenced in Section B0.3 of the contract occupies approximately the northern half of Prince of Wales Island, and the Gedney Pass, Traitors Cove, and Neets Bay areas on Revillagigedo Island. This is often referenced as the contract "primary sale area." Section B0.31 of the contract references an area approximately equivalent to the remainder of the Ketchikan Area of the Tongass National Forest as an area within which the Forest Service is authorized to make available additional timber for harvest under the contract, if the quantity of timber available for harvest within the primary sale area is not sufficient to meet contract supply obligations. This additional area is often referenced as the contract "contingency area."

The designated sale area, and as necessary the contingency area, remain the dominant sources for meeting KPC contract timber volume obligations. Congress in enacting the Tongass Timber Reform Act declined to modify the contract sale area, and by directing in section 301(e) of the statute that the Secretary of Agriculture report to Congress on the effects of eliminating the sale area, indicated an intent to reserve this decision to the legislature.

The Alaska Native Claims Settlement Act (ANCSA) and Alaska National Interest Lands Conservation Act (ANILCA) provide authority to offer timber from outside the Contract sale area or contingency area to substitute for areas selected by Native Corporations under ANSCA or designated by Congress as Wilderness in ANILCA that are within the sale area or contingency area. This authority can be used as needed to meet Contract volume requirements. Although statements have appeared in past EIS documents indicating this substitution had been completed, those statements were in error.

With regard to providing timber volume under the Contract, section B0.61 and section B0.62, read as follows:

> **B0.61 Timber Offering Schedule.** Each year prior to February 15, Forest Service after consultation with purchaser shall develop a tentative Offering schedule based upon the Tongass National

Forest Land and Resource Management Plan, which shall display Offering Areas and timber volumes proposed for harvest, and the expected NEPA process commencement and completion date for making any additional Offerings under the terms of this contract. To the extent authorized by law, Offering Areas may be identified for harvest outside the Sale Area, as needed to meet sale volume requirements. The tentative schedule shall list sufficient timber volume and schedule commencement of the NEPA process by Offering Area or Areas to provide Purchaser a Current Timber Supply sufficient for at least three years of operations hereunder or until the contract termination date, whichever occurs first, adjusting for the provisions of B0.63 and B6.36. In developing the schedule, Forest Service will consider the production requirements of Purchaser's manufacturing facilities.

B0.62 Specifying Offerings for Harvest. Based upon the tentative schedule and NEPA process, and consistent with timber sale planning, management requirements, and environmental assessment procedures for independent Tongass National Forest timber sales, Forest Service after consultation with Purchaser and completion of the NEPA process, shall specify any additional Offerings. Forest Service shall seek to specify sufficient Offerings to maintain a Current Timber Supply in all Offering Areas that totals at least three years of operations hereunder or until the contract termination date, whichever occurs first, and which meets the production requirements of Purchaser's manufacturing facilities.

As indicated above, section B0.62 states in part "Forest Service shall seek to specify sufficient Offerings to maintain a Current Timber Supply in all Offering Areas that total at least three years of operations hereunder or until the contract termination date, whichever comes first, and which meets the production requirements of Purchaser's manufacturing facilities." "Current Timber Supply" is defined in the contract generally as timber which the Forest Service has specified according to Forest Service planning procedures and for which the NEPA process has been completed. The Forest Service specifies timber by approving in writing a timber "Offering" under the contract, comparable to an independent timber sale. This approval in writing is represented by issuance of an "A Division" contract document for the Offering.

An EIS such as the Upper Carroll Project Area EIS may cover one or more of these Offerings, which may be specified by the Forest Service and therefore added to the contract "Current Timber Supply" concurrently or sequentially after issuance of the Record of Decision (ROD) for the Project. Generally, layout on the ground of roads and harvest units selected in the ROD will be completed for each Offering prior to issuance of the "A Division" approval document.

Any long-term contract offerings implemented through this Project will help meet long-term contract timber supply needs. Section B0.63 of the contract allows KPC to reject timber offerings specified by the Forest Service. In that event, the contract provides for resale of the offering as part of the independent timber sale program. Thus, any long-term contract timber offering cleared through the NEPA process is subject to reoffer as an independent timber sale.

As for obligations of KPC, contract provisions require KPC, among other duties, to pay for and harvest timber, construct and operate a pulp manufacturing plant, and to recruit labor from residents of Southeast Alaska. KPC operates a pulp mill and a sawmill in Ketchikan and a sawmill in Metlakatla.

Current Timber Supply and Volume Needs

The maximum average annual rate per year at which KPC is generally allowed to harvest is 192.5 MMBF under long-term contract section B0.52. KPC's average harvest rate, obtained from contract records, during the five-year period from March 1, 1989 through February 28, 1994 was 185.4 MMBF per year. Using these figures for planning and projection purposes, a three year supply of timber for KPC's operations under the contract is estimated to range from 556.2 to 577.5 MMBF.

Current projections indicate that areas with available timber outside as well as within the designated sale area and contingency area will be necessary for harvest in order to meet contract supply requirements. As of July 1, 1996, KPC had a current timber supply of approximately 299 MMBF. The maximum volume of timber that can be provided to KPC from within the designated sale area in the remainder of fiscal year 1996 is about 3.5 MMBF. The maximum amount that can be provided to KPC from within the total contract area during 1997 is expected to be about 156 and during 1998 about 103.7 MMBF. Assuming the maximum annual average harvest rate of 192.5 MMBF, a timber supply of 110 MMBF would be available at the end of 1996, 75.5 MMBF at the end of 1997, and 0 MMBF at the end of 1998. These levels would fall well short of meeting the objective of specifying a three-year supply for operations under the contract, considering on-going harvest at either the maximum or historic rates noted above. KPC in 1996 or 1997 may harvest far less than the maximum or historical annual average harvest. But for purposes of planning and completing the NEPA process for timber sale projects, the Forest Service strives to be prepared for KPC to harvest at maximum levels authorized under the contract, to assure ability to meet contract supply needs.

There have been suggestions that layout and other actions could be expedited to increase the amounts available from the KPC sale area and contingency area through 1997. However the current assessment is that further expediting layout is not feasible, even with significant increased funding, while maintaining a reasonable assurance of quality work. The Forest Service has made efforts to accelerate the preparation of new offerings within the KPC sale area and contingency area. At present, about 591.7 MMBF in new timber projects are being planned within the KPC sale area and contingency area over the duration of the contract, beyond what is projected in the 1996 - 1998 figures presented above. However, because of the amount of time required to prepare new offerings in accordance with applicable laws, none of this volume is projected to be available until after fiscal year 1998. It remains to be seen how much of the volume in preparation will be cleared through the NEPA process and when it will be available.

Consequently, additional timber from outside the sale area and contingency area is projected to be needed in order to meet the three-year timber supply objective. Sale offerings currently scheduled, undergoing NEPA evaluation, or at some other stage in the preparation process are projected to be needed to help meet the long-term contract and independent sale program's three-year supply objectives. If any currently planned independent sales were converted to long-term contract offerings, equivalent volume currently planned for long term contract offerings would then need to be substituted as independent sale offerings in order to meet program objectives. The first offerings from the Upper Carroll Project Area could be made available in 1997 to help meet either three-year supply objective.

The projected need to offer volume from outside both the primary sale area and contingency sale area is based on the fact that all remaining areas with available timber within the primary sale area and contingency area are expected to have timber offerings under the long-term contract by the year 2004. In making this projection, no more than local use levels of timber harvest under contract section B0.32 are projected in the primary sale area through 2004. Nevertheless, insufficient quantities of economically operable timber appear to remain available within the primary sale area and contingency area to satisfy long-term contract requirements through the year 2004. Volume estimates from the TLMP RSDEIS preferred alternative indicate that the total ASQ from the total long-term contract sale area would be 132 MMBF per year, with 119 MMBF per year of that volume considered economically viable.

The Upper Carroll Project Area is [within/outside] the designated sale area for the long-term contract [The Project Area is within/also outside the contingency area designated in the contract]. More information on why the Upper Carroll Project Area was scheduled for environmental analysis at this time in addition to other areas is presented in the TLMP and Forest Plan Implementation sections below.

Why Providing Less Than The Needed Contract Supply Was Not Considered In Detail

Congress in section 301(e) of the TTRA also indicated its intent to reserve to itself the question of providing less than the contract supply obligation to KPC. The Forest Service can expect a large monetary claim from KPC for not meeting contract supply obligations, for which there is no current funding. To the contrary, recent federal appropriations legislation has dedicated additional money to providing additional timber offerings to KPC and other Tongass National Forest timber purchasers. Volume from independent timber sales or sources outside the Tongass National Forest do not fulfill long-term contract requirements. In any case, there is not sufficient projected volume from other sources to meet KPC supply requirements.

Logs from Native corporation lands cannot substantially meet the total needs of KPC. Owners of private timberland are able to sell their sawlogs on the export market for much higher prices than are being paid by local manufacturing. KPC is not prohibited under the contract from purchasing timber from Native corporations or other sources, subject to the requirement that, "at least three-fourths of the pulpwood requirements of the pulp manufacturing plant and other processing facilities operated in conjunction with this sale shall be cut from the areas covered by this agreement during the period prior to July 1, 1964, and during each 5-year operating period sebsequent to that date." (contract section B0.53). There are no provisions in the Contract to offset such purchases by adjusting the contract timber supply. Harvest from Native corporation lands is decreasing, reducing potential pulp as well as sawlog availability from these lands (TLMP RSDEIS page 3-268).

Canadian timber has been mentioned in the past as a source of supply for Southeast mills. Southeast Alaska pulp mills have purchased pulp logs from British Columbia (BC) in the past. However, the political and economic situation in British Columbia has changed to decrease the likelihood of a substantial supply from this source. The June 1988 issue of British Columbia Lumberman, page W14, states that a substantial increase in demand for BC forest products is expected to decrease log exports. The Forest Minister stated: "Our main objective is to use BC timber to manufacture wood products in this province." It has been more recently stated that British Columbia is considering prohibiting log exports and is facing increased environmental pressures. KPC was able to purchase slightly under 10 MMBF of pulp logs from Canada in 1996 (Industry sources). However this purchase was considered a rare occurrence since it was due to a Canadian pulp mill being temporarily shut down for repairs and KPC was willing to pay relatively high prices for the pulp logs.

Southeast Alaska Timber Demand

Introduction.

Another reason for scheduling the environmental analysis of the Upper Carroll Project Area is the overall demand for Tongass National Forest timber. This reason is separate but complementary to the long-term contract reasons. It is important to note that the Forest Service obligations under the long-term contract are clearly separate from the Forest Service obligations under Section 101 of TTRA. The discussion in this section does not define any of the Forest Service's obligations under the long-term contract discussed in the previous section. For example, the Alaska Forest Association (AFA) prediction that only 35% of all logs will be pulped does not affect long-term contract obligations.

In general, this section indicates that areas with available timber both inside and outside the KPC sale area will also be necessary to consider for harvest in order to seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest and (2) meets the market demand from such forest for each planning cycle, pursuant to Section 101 of the Tongass Timber Reform Act.

Ketchikan Pulp Company.

The dissolving pulp mill operated by KPC reportedly requires 190 MMBF of pulpwood and/or chips annually to operate at its full annual capacity of 210,000 tons. This capacity exceeds the 525 tons per day capacity specified in the long-term contract in section B0.11. KPC also operates two sawmills with a reported combined log processing capacity of 110 MMBF annually. Chip by-products from the sawmills are used in pulp manufacture. The KPC pulp and sawmills are supplied by timber from Tongass independent timber sales as well as long-term contract

Independent Mills.

At the present time, Viking Lumber (purchasers of the "Klawock mill") and Seaborne Lumber Company are the primary processors of timber from the independent sale program. At present, Seaborne Lumber Company is not currently operating. The mill is temporarily shut down, citing a lack of certainty about Tongass timber supply as one of the reasons. During this shutdown, a relocation to Prince of Wales Island is under consideration. This relocation may include restructuring of the mill to produce more value added finished products rather than rough lumber. The two sawmills are the largest independent mills operating in the region and have a reported combined processing capacity of 65 MMBF per year.

A third large sawmill is located in Wrangell and owned by Alaska Pulp Corporation (APC). Despite the record lumber prices at the time, the mill was closed indefinitely on November 30, 1994. Although APC has offered to sell the mill, at least one prospective purchaser has declined to purchase it, citing a lack of certainty about Tongass timber supply as one of the reasons.

Another market segment for independent timber sales includes four relatively small sawmills, with an estimated combined processing capacity of 30 MMBF per year. Finally, there are at least 10-12 other buyers who use very small amounts of wood in the manufacture of musical instruments, cedar shakes, shingles, and lumber using small, portable mills. The combined annual processing capacity of these smaller operations is estimated at 7 MMBF.

Description of Timber Consumption Scenarios

To develop an estimate of the volume of Tongass timber likely to be consumed by the timber industry in Southeast Alaska, this section analyzes: 1) the percent of installed wood processing capacity that is typically utilized, 2) the proportion of the wood supply that is typically sawn, and 3) the availability of supply from other sources, including Native corporations, the State of Alaska, and imports. The approach used to estimate each of these variables is discussed below.

Capacity Utilization.

For many years, the Forest Service has monitored installed capacity as reported by the firms operating sawmills and pulp mills in Southeast Alaska. These reports cover a twenty-four year span (1970-1994) in which the reported total annual mill capacity ranged from a high of 785 MMBF in 1980 to a low of 519 MMBF following the 1993 closure of the Sitka pulp mill. Processing capacity in sawmilling has been especially volatile over the years, following trends in market cycles. Sawmill capacity was reported at 199 MMBF in 1970, increased to a high of 435 MMBF in 1979, dropped back down to 240 MMBF in the mid-eighties, and increased again to 329 MMBF in 1994.

Because the bulk of Alaska's wood products have traditionally moved into export markets, trade statistics compiled by the U.S. Department of Commerce can be used to approximate the aggregate output of sawmills and pulp mills in Southeast Alaska for a corresponding number of years. Estimates such as these have already been generated by the Pacific Northwest Research Station for the period 1970-1991 (cite Brooks and Haynes, June 1994)

and recent Forest Service reports provided similar data for more recent years (cite 706(a) reports).

This data was used to calculate the average rate of capacity utilization for sawmills and pulp mills in Southeast Alaska over the last decade (1985-1994). This time period was chosen because it encompasses both extremes in the market cycle for lumber and pulp. It is also representative of industry operations following the period of restructuring that occurred in the early eighties, and is therefore more likely to reflect the operational considerations faced by the industry today. The available data indicate that over the last decade, sawmills in Southeast Alaska actually utilized an average of 54 percent of their reported log processing capacity. In contrast, an average of 86 percent of the reported pulp mill capacity was utilized over the same period of time.

Proportion of Wood Sawn.

It is important to recognize that sawmill consumption and capacity both refer only to the sawable portion of the timber supply. This in turn depends on end product selling values and the physical characteristics of the timber. The lower quality logs included in most timber sales are generally not sawn. The Alaska Forest Association (AFA) reports that the "best utilization of the Tongass fiber" is for 65 percent of the spruce and hemlock harvested to be sawn, with the remainder used in pulp manufacture (Source: FAX dated 10/26/95 -- Minimum Tongass National Forest Timber to Support Ketchikan Pulp Company). Thus, it is assumed in all the calculations for this report that the sawmills in the region process about 65 percent of all spruce and hemlock purchased. However, it is recognized that this percentage does fluctuate depending on market price swings for both lumber and pulp and other factors, and varies by mill (706(a) Supply and Demand Report, 1994; pages 2-4; 11-12; 15-17; 23-26; and 29-31).

Additional Sources of Supply.

This section repeats some of the same items presented under the KPC long-term contract discussion. They are being repeated here since other mill owners in Southeast Alaska face the same situation. Mill owners in Southeast Alaska have stated that their operations are dependent on the supply of timber provided from the Tongass National Forest. As is noted below, other sources of timber supplies are expected to be available only intermittently and in small quantities. For purposes of this analysis we assume that other supply sources will continue to make a relatively small contribution to total timber availability in the region each year, on the order of 20 MMBF of generally pulp quality material.

Although Canadian logs were obtained at a very low cost in the early 1980's, they typically do not serve as an economical supply for Alaska's mills. Canada's log exports in general have declined as cutbacks in timber supply were initiated as the Canadian government responded to environmental concerns. A subsequent rise in selling values for Canadian pulp logs has kept Alaska's import volumes at a near-zero level for the past several years. KPC was able to purchase slightly under 10 MMBF of Canadian pulp logs during 1996, however this was due primarily to the temporary shut down of a British Columbia pulp mill and KPC's willingness to pay high prices for the logs.

Since 1983, timber harvest on lands owned by Alaska Native corporations has exceeded harvest levels on the Tongass. However, in contrast to National Forest timber supplies, timber from Native lands is not subject to in-State processing requirements. Because export market prices greatly exceed those paid by local manufacturers, all but the lowest quality Native timber is sold overseas. Therefore, although some Native pulp logs are sold locally, this

timber is not well-suited for lumber production and generally does not meet the needs of the local sawmills.

Some 58,000 acres of State land are available for timber management in the Haines vicinity and another 3,000 acres near Yakutat. After several years of inactivity, the timber sale program was recently resumed on the Haines State Forest. The State's timber program in Southeast is relatively small, however, with an average annual harvest of 9 MMBF over the last five years.

Table 1. Timber Consumption Scenario #1 -- Reported Mill Capacity

	Capacity Log Consumption	*By-Product Chips*	*Pulp Logs*
Ketchikan Pulp Company			
Pulp Mill	190		
Ketchikan Sawmill	50	20	27
Annette Island Sawmill	60	24	32
Larger Sawmills			
Viking Lumber Chip Mills	30	12	16
Seaborne Lumber Company	35	14	19
APC Wrangell Mill	110	44	59
Smaller Sawmills			
Metlakatla Indian Tribe (MITE)	10	4	5
Pacific Rim Cedar	10	4	5
The Mill, Inc.	5	2	3
Jim Ensley	5	2	3
Misc Other Small Purchasers (This includes music wood, cedar salvage, and small portable sawmilling operations)	7	3	4

Summary 1a. Reported Capacity Consumption Scenario w/Wrangell Mill

Total Wood Consumption	512 MMBF
Sawn	322 MMBF
Pulped	190 MMBF

Total chip by-products generated	129 MMBF
Total pulp log harvest	173 MMBF
Pulp logs from Native Corps./imports	20 MMBF
	---
	322 MMBF

Subtotal spruce/hemlock = sawlog + pulp log = 322 MMBF + 173 MMBF = 495 MMBF
Cedar component (12% of harvest) = 68 MMBF
TOTAL TONGASS HARVEST = 495 MMBF spruce/hemlock + 68 MMBF cedar = 563 MMBF

Note: Under these conditions it appears excess pulp fiber would be available in Southeast Alaska, i.e. 129 MMBF in chip by-products + 173 MMBF pulp log plus 2- MMBF from other sources harvest - 190 MMBF = 132 MMBF in excess of that needed to run pulp mill at capacity. Under these conditions, a higher percentage of the wood supply would likely be sawn, and, depending on market conditions, surplus chips might also be exported.

Summary 1b. - Reported Capacity Consumption Scenario w/o Wrangell Mill

Assuming the Wrangell mill remained closed and all other mills operated at capacity, the summary numbers would be as follows:

Total Wood Consumption	402 MMBF
Sawn	212 MMBF
Pulped	190 MMBF

Total chip by-products generated	85 MMBF
Total pulp log harvest	114 MMBF
Pulp logs from Native Corps./imports	20 MMBF
	---
	219 MMBF

Subtotal spruce/hemlock = sawlog + pulplog = 212 MMBF + 114 MMBF = 326 MMBF
Cedar component (12% of harvest) = 44 MMBF
TOTAL TONGASS HARVEST = 326 MMBF spruce/hemlock + 44 MMBF cedar = 370 MMBF

Note: Most chip by-products and pulp logs harvested would be likely consumed by the KPC pulp mill under this scenario, leaving an estimated 29 MMBF of pulp material for export or other uses (85 + 114 + 20 - 190 = 29).

Table 2. Timber Consumption Scenario #2 - Reported Decade Average Capacity Utilization (KPC pulp mill 86 percent of capacity; sawmills 54 percent of capacity)

Ketchikan Pulp Company	Average Log Consumption	By-Product Chips	Pulp Logs
Pulp Mill	163		
Ketchikan Sawmill	27	11	15
Annette Island Sawmill	32	13	17
Larger Sawmills			
Viking Lumber/Chip Mill	16	6	9
Seaborne Lumber Company	19	8	10
APC Wrangell Mill	59	24	32
Small Sawmills			
Metlakatla Indian Tribe (MITE) 5		2	3
Pacific Rim Cedar	5	2	3
The Mill, Inc.	3	1	1
Jim Ensley	3	1	1
Misc Other Small Purchasers (This includes music wood, cedar salvage, and small portable sawmilling operations)	4	2	2

Summary 2a. Reported Decade Average Capacity Utilization Scenario w/ Wrangell Mill

Total Wood Consumption	337 MMBF
Sawn	174 MMBF
Pulped	163 MMBF
Total chip by-products generated	70 MMBF
Total pulp log harvest	94 MMBF
Pulp logs from Native Corps./imports	20 MMBF
	---
	184 MMBF

Subtotal spruce/hemlock = sawlog + pulp log = 174 MMBF + 94 MMBF = 268 MMBF
Cedar component (12% of harvest) = 36 MMBF
TOTAL TONGASS HARVEST = 268 MMBF spruce/hemlock + 36 MMBF cedar = 304 MMBF

Note: Under these conditions the fiber supply from the Tongass (and the by-products generated from it) would be exactly equal to the volume of wood consumed by the pulp mill and sawmills.

Summary 2b. Reported Decade Average Capacity Utilization Scenario w/o Wrangell Mill

Assuming the Wrangell mill remained closed and all other mills operated at the decadal average capacity utilization level, the summary numbers would be as follows:

Total Wood Consumption	278 MMBF
Sawn	115 MMBF
Pulped	163 MMBF
Total chip by-products generated	46 MMBF
Total pulp log harvest	62 MMBF
Pulp logs from Native Corps./imports	20 MMBF
	---
	128 MMBF

Subtotal spruce/hemlock = sawlog + pulplog = 115 MMBF + 62 MMBF = 177 MMBF
Cedar component (12% of harvest) = 24 MMBF
TOTAL TONGASS HARVEST = 177 MMBF spruce/hemlock + 24 MMBF cedar
= 201 MMBF
35 MMBF
236 MMBF
*see note below

Note: Under this scenario, there would not be enough pulp logs and chips generated from operation of the sawmills to run the KPC pulp mill at 86 percent of capacity. Approximately 35 MMBF of additional timber sale volume would be required to meet the production assumptions in this scenario.

Tongass Timber Outlook

As of July 1996, a total of 110 MMBF of timber was under contract to independent sale operators and 299 MMBF was released and unharvested under the long-term contract with KPC.

An additional 275.3 MMBF of timber is currently projected to be offered as independent sales before the end of fiscal year 1998 and 376.2 MMBF is projected to be offered under the long-term contract.

Table 3. Projected Timber Sales FY 1996 Through FY 1998

Remaining 1996 Independent Sales

Rod'n Apple	Chatham Area	9.0 MMBF
Shamrock	Stikine Area	21.0 MMBF
	TOTAL FY 1996	30.0 MMBF

FY 1997 Independent Sales

Sentinal Island	Ketchikan Area	6.8 MMBF
Heceta Sawfly	Ketchikan Area	12 MMBF
District Small Sales	Ketchikan Area	6.8 MMBF
Poison Cove	Chatham Area	19.1 MMBF
Lisa Creek	Chatham Area	6.6 MMBF
Waterwold	Chatham Area	9.5 MMBF
Duffield	Chatham Area	20.5 MMBF
Indian River	Chatham Area	10 MMBF
King George	Stikine Area	20 MMBF
South Lindenburg	Stikine Area	22 MMBF
King George II	Stikine Area	2 MMBF
PRD Small Sales	Stikine Area	3 MMBF
	TOTAL FY 1997	138.3 MMBF

FY 1998 Independent Sales

Control Lake Misc.	Ketchikan Area	5 MMBF
District Small Sales	Ketchikan Area	4 MMBF
Nakwasina	Chatham Area	3 MMBF
Ushk Bay 1	Chatham Area	20 MMBF
Lindy	Stikine Area	30 MMBF
Fanshaw	Stikine Area	40 MMBF
King George III	Stikine Area	2 MMBF
PRD Small Sales	Stikine Area	3 MMBF
	TOTAL FY 1998	107 MMBF

Remaining 1996 KPC Contract Volume

Neka 1	Chatham Area	30.0 MMBF
	TOTAL FY 1996	30.0 MMBF

FY 1997 KPC Contract Volume

Naukati/Sarkar	Ketchikan Area	13.0 MMBF
Polk	Ketchikan Area	35.9 MMBF
Carroll	Ketchikan Area	20.0 MMBF
Control Lake 1	Ketchikan Area	30.0 MMBF
Control Lake 2	Ketchikan Area	30.0 MMBF
Lab Bay 1	Ketchikan Area	20.0 MMBF
Lab Bay 2	Ketchikan Area	20.0 MMBF
Neka 2	Chatham Area	15.0 MMBF
	TOTAL FY 1997	183.9 MMBF

FY 1998 KPC Contract Volume

12 Mile South	Ketchikan Area	9.1 MMBF
Teal	Ketchikan Area	23.7 MMBF
Bluff Lake	Ketchikan Area	20.0 MMBF
Control Lake 3	Ketchikan Area	30.0 MMBF
Control Lake 4	Ketchikan Area	30.0 MMBF
Port Houghton 1	Chatham Area	30.0 MMBF
Canal/Hoya	Stikine Area	20.0 MMBF
	TOTAL FY 1998	162.8 MMBF

Meeting Market Demand

Timber demand in Southeast Alaska can vary dramatically from year to year. The level of demand is dependent on complex interactions among factors that are difficult, if not impossible, for the industry or the Forest Service to predict with accuracy. Such factors include fluctuations in interest rates, housing starts, business cycles in the United States and overseas, changes in the value of the dollar with respect to foreign currencies, changes in import tariffs, and changes in export policies in other countries.

To be responsive to market demand, the Forest Service attempts to provide an opportunity for the industry as a whole to accumulate a supply of purchased but unharvested timber (i.e. volume under contract) equal to about three years of timber consumption. There are a number of reasons for allowing the accumulation of volume under contract. First, this allows the industry ample time to plan an orderly and systematic harvest schedule that meets all timing restrictions and permit requirements. Second, it allows the industry to better manage its financial resources and to secure financing on the basis of longer term timber supply. Third, it allows time for the necessary infrastructure (roads, log transfer facilities, and logging camps) to be put in place prior to timber harvest. Finally, an ample timber supply gives the industry more opportunity to sustain itself through market cycles. If demand for pulp or lumber in any year suddenly increases, producers will have access to enough timber to respond to the increase in demand without waiting for the Forest Service or the Congress to take action. Normally, the unharvested volume under contract will be drawn down during high points in the market when mills increase production, and built up when markets are poor and production declines. In response to changes observed in the volume under contract the Forest Service may consider adjusting its budget and timber program.

For purposes of this analysis, the same alternative measures of timber consumption described previously are used to approximate the three-year timber supply goal. The forest-wide average cedar component of 12 percent is added to the consumption estimates to put the three-year supply goal in terms of total timber sale volume. Again, under Scenario 1 it is assumed that reported mill capacity is the best approximation of short-term timber consumption. Using this assumption, a three-year timber supply equates to 1,689 MMBF (including cedar) (Table 4). Under Scenario 2, it is assumed that the reported average capacity utilization over the last decade is the best approximation of short term timber consumption. Using these assumptions, a three-year timber supply equates to 912 MMBF (including cedar) (Table 5). The effect of a permanent closure of the Wrangell mill is also examined for each alternative.

Table 4. Three-Year Supply-Scenario 1

	Capacity Consumption	*Cedar*	*3-Year Supply*
All mills including Wrangell	495 MMBF	68 MMBF	1689 MMBF
All mills excluding Wrangell	326 MMBF	44 MMBF	1110 MMBF

Table 5. Three-Year Supply-Scenario 2

	Decade Avg. Capacity Utilized	*Cedar*	*3-Year Supply*
All mills including Wrangell	268 MMBF	36 MMBF	912 MMBF
All mills excluding Wrangell	212 MMBF	24 MMBF	708 MMBF

Summary

It is reasonable to anticipate that the independent mills currently in operation and KPC will seek to purchase a minimum of 15 MMBF in timber sale volume from the Forest Service at the earliest possible opportunity in order to meet decadal average consumption rates through FY 1998 (Table 6). For all mills to operate at reported capacity throught FY 1998, an estimated 243 MMBF in timber sale volume would need to have been made available by the Forest Service in time for logging and road building activities to be completed early in the season. This figure should be viewed as an absolute minimum. It is highly unlikely that timber purchasers could obtain the necessary permits and meet all timing restrictions on road construction and harvest and still make use of the entire timber volume provided in a single season. Additional offerings would allow for these constraints as well as provide the opportunity for the mills to increase capacity utilization, accumulate volume under contract, and/or for the Wrangell sawmill and others to be reopened. Under the timber consumption scenarios described above, a minimum of 636 MMBF in additional (roaded and accessible) timber sale volume would be needed to satisfy the objective of providing a three-year supply of volume under contract. Thus, timber offerings of 855 MMBF by the end of FY 1998 would provide a supply of timber for KPC and the independent mills currently in operation while allowing for the accumulation of three years of volume under contract (based on the 10-year average rate of timber consumption) as a buffer to market volatility. The projected sale offerings for FY 1996-FY 1998 falls short of this mark by 203 MMBF.

Should the Wrangell mill reopen it is reasonable to anticipate that the independent mills currently in operation and KPC will seek to purchase a minimum of 127 MMBF of timber from the Forest Service at the earliest possible opportunity in order to meet projected consumption rates through FY 1998 (Table 7). For all mills to operate at reported capacity through FY 1998, an estimated 581 MMBF in timber sale volume would need to be made available by the Forest Service in time for logging and road building activities to be completed early in the season. Again, for reasons discussed above, this should be viewed as a conservative estimate. Under the timber consumption scenarios described above, a minimum of 804 MMBF in additional timber sale volume would be needed to satisfy the objective of providing a three-year supply of volume under contract to independent operators and KPC. Thus, timber offerings of 931 MMBF by the end of FY 1998 would provide a supply of timber for KPC and the independent mills currently in operation while allowing for the accumulation of three years of volume under contract (based on the 10-year average rate of timber consumption) as a buffer to market volatility. The sale schedule for FY 1996-98 falls short of this mark by 279 MMBF.

These projections do not include any additional volume that may become available in fiscal year 1997 or 1998 as a result of supplemental NEPA analysis required to lift the current AWARTA vs. Morrison court injunction, which affects about 175 MMBF of timber cleared in prior EIS's. It is not reasonable to project availability of any of this enjoined timber volume at least until after completion of the additional NEPA analysis. The projected sale offerings do include the Poison Cove sale that is the subject of a current court challenge and other sales offerings which may be subject to administrative appeals and litigation.

Table 6. Summary Excluding Wrangell Mill

	1/Volume Under Contract	24-mo. - Consump-tion	Likely Purchase (a)	3-year Supply (b)	(a+b)	Projected Offerings 96-97	Shortfall
Scenario 1:	220	652	432	978	1410	568.9	841.1
Scenario 2:	220	424	204	636	840	568.9	271.1

Note: Volumes are in MMBF (sawlog + utility). Volume under contract and scheduled sales do not include volume enjoined.

Table 7. Summary Including Wrangell Mill

	1/Volume Under Contract	24-mo. Consump-tion	Likely Purchase (a)	3-yr. Supply (b)	(a+b)	Projected Offerings 96-97	Shortfall
Scenario 1:	220	990	770	1485	2255	568.9	1686.1
Scenario 2:	220	536	316	804	1120	568.9	551.1

Tongass Land Management Plan

TLMP As Amended Winter 1985-86

Chapter 1 of this EIS includes an explanation of how this project relates to the Tongass Land Management Plan. That section describes the Land Use Designations (LUDs) which allocate land areas to different types of management. Chapter 1 also explains that these LUDs were assigned to land areas known as Value Comparison Units (VCUs), and that one or more contiguous VCUs were formed into Management Areas (MAs). This section also describes the management emphasis for the Management Areas likely to be affected by the Upper Carroll Project.

The Tongass Land Management Plan, As Amended Winter 1985-1986, not only detailed Management Direction/Emphasis for each Management Area, it also scheduled specific acres for timber harvest over time. Table 8 displays acreage in each Management Area scheduled for harvest and how many of those acres have already been harvested.

Table 8
TLMP, As Amended Winter 1985-86, Suitable Scheduled Acres

Management Area	Acres Scheduled	Existing Harvest	Percent Harvested
CO3	4506	0	0
C07	2235	0	0
C10	18228	79	0
C13	25727	140	1
C14	19495	20	0
C15	4502	1821	40
C18	5664	460	8
C19	3502	820	23
C21	27139	0	0
C24	2190	0	0
C25	7365	0	0
C27	9807	681	7
C28	21399	1742	8
C29	14081	2940	21
C30	34200	9479	28
C31	22358	4220	19
C32	9800	1920	20
C34	19376	1937	10
C35	8745	1898	22
C36	10723	240	2
C37	48754	18937	39
C39	16301	439	36
C40	32374	9341	29
C41	22321	7864	35
C43	22453	3183	14
C44	25694	6187	24
C45	9096	80	1
C48	13650	0	0
C53	17708	1722	10
C55	3550	541	15
C58	33073	0	0
CHATHAM TOTAL	**516016**	**76691**	**15**

Table 8 (continued)
TLMP, As Amended Winter 1985-86, Suitable Scheduled Acres

Management Area	Acres Scheduled	Existing Harvest	Percent Harvested
S01	11954	60	1
S04	58630	20593	35
S07	13690	60	0
S08	11051	0	0
S09	29929	3356	11
S10	28642	3481	12
S11	32532	7308	22
S13	32767	3478	11
S16	21908	3903	18
S17	25782	8567	33
S18	5220	4266	82
S19	38901	13225	34
S20	15441	4014	26
S21	6436	2699	42
S22	3293	1081	33
S23	41368	5306	13
S25	30389	6601	22
S26	11766	180	2
S29	9020	5392	60
S31	4201	200	5
S33	8902	1780	20
S35	15022	5698	38
STIKINE TOTAL	**456844**	**101248**	**22**

Table 8 (continued)
TLMP, As Amended Winter 1985-86, Suitable Scheduled Acres

Management Area	Acres Scheduled	Existing Harvest	Percent Harvested
K01	30689	15444	50
K02	8112	317	4
K03	50689	22072	44
K04	20098	4559	23
K05	30331	15710	52
K07	67082	36078	54
K08	63864	15096	24
K09	45100	25009	55
K10	16714	6177	37
K11	30261	15083	50
K13	18655	20	0
K14	26872	16303	62
K15	20932	4759	23
K17	26377	16303	62
K18	29827	5805	19
K19	8816	60	1
K20	14201	702	5
K21	37920	1796	5
K22	27030	420	2
K24	30426	1704	6
K25	16048	0	0
K28	10864	0	0
K29	30968	0	0
K30	30885	841	3
K32	45414	16723	37
K34	171	20	12
K35	27446	10436	38
K39	14491	1199	8
K41	1664	603	36
K44	1306	0	0
KETCHIKAN TOTAL	**783253**	**219817**	**28**

The Allowable Sale Quantity (ASQ), calculated in TLMP and used in Congressional deliberations and decisions on ANILCA, assumed harvest in all LUD III and LUD IV VCUs, in compliance with the Southeast Area Guide, on a three entry, 100 year rotation. Some selected areas were scheduled for 4 entries in 120 years (LUD IV) and 6 entries in 200 years (LUD III) for visual considerations. A three entry rotation assumes the first entry will be made within 30 to 40 years. If areas are not entered, and the ASQ is harvested, other areas will have to receive a heavier entry, resulting in a pattern of high percentage first entries being established, and therefore creating conditions under which the three-entry rotation may not be achievable.

The TLMP as amended also scheduled as anticipated management outputs from the Tongass National Forest timber volume ranging from 300 million to 450 million annually (Tongass Land Management Plan Amended Winter 1985-86, page 4).

Revised Supplemental TLMP Revision Draft EIS (TLMP RSDEIS)

1. Sufficient Volume for Long Term Contract and Independent Timber Sale Program Needs in TLMP RSDEIS.

The TLMP RSDEIS Chapter 3 section on timber (pages 3-166, 167 and 168) provides the following summary statements in terms of the timber supply and the long-term timber sale programs.

> The total projected output varies from 0 MMBF in Alternative 1 to 282 MMBF in Alternative 7; the NIC I component varies from 0 to 252 MMBF. Alternatives 7 and 9 appear to have the capability of satisfying contractual planning needs. However, the remaining alternatives may jeopardize the Forest Service's ability to satisfy the contract planning needs from the contract area; volume would probably have to be obtained from elsewhere on the Forest... There appears to be sufficient additional volume from Chatham and Stikine in Alternatives 2, 3 6 and 8 to meet contractual planning needs. Alternatives 1, 4 and 5 still appear to jeopardize the Forest Service's ability to meet its contract planning needs.
>
> The available NIC I ASQ portions of Alternatives 2, 6, 7, 8 and 9 are sufficient to meet the 100 MMBF SBA goal. Alternative 3 could support a reduced SBA goal. Alternatives 1, 4 and 5 could not supply any timber beyond the KPC amount.

These statements indicate that timber supply exceeds the level which is required to satisfy the long-term timber sale contract in alternatives 2, 3, 6, 7, 8 and 9 with additional timber available for independent sales. The data to support these statements is displayed in Table 3-66 on page 3-167, Table 3-67 on page 3-167 and Table 3-68 on page 3-168 of TLMP RSDEIS.

Furthermore, TLMP RSDEIS estimates the number of acres of tentatively suitable lands that are scheduled to be harvested over the planning horizon for each Management Area. The following Table displays the results of that analysis for the preferred alternative. This table indicates that the scheduling of the Upper Carroll Project Area and other project areas within and outside the KPC sale area and contingency area to meet contract volume requirements over the next several years is anticipated. In addition, this table shows that there are adequate suitable acres in these Management Areas, scheduled to be harvested, to provide that volume. It displays, for the preferred alternative, the scheduled suitable acres by Management Area. Table 9 is similar to Table 8 which showed the Management Areas scheduled for timber harvest. A comparison of these two tables indicates that the Management Areas identified as appropriate for timber harvest activities in the existing TLMP (as amended winter 1985-86) are also identified as appropriate in the preferred alternative of TLMP RSDEIS.

Table 9
TLMP RSDEIS Preferred Alternative Scheduled Acres (selected Management Areas)

Management Area	Acres Scheduled	Existing Harvest	Percent Harvested
C02	5101	500	10
CO3	4413	78	2
C07	1310	0	0
C10	8002	874	11
C13	22148	0	0
C14	23291	0	0
C15	4309	1509	37
C17	78	0	0
C18	888	0	0
C19	5621	1167	21
C27	2042	240	12
C28	10895	548	5
C29	10446	1795	17
C30	24442	5344	22
C31	17760	4250	24
C32	2320	500	22
C33	2711	78	3
C34	14441	999	7
C37	32456	10388	32
C39	3700	38	1
C40	10919	1493	14
C41	19036	3893	20
C43	3648	888	25
C44	12945	3546	27
C46	684	194	28
C48	680	0	0
C53	15275	7197	47
C54	1586	1022	64
CHATHAM TOTAL	261047	46622	18

Table 9 (continued)
TLMP RSDEIS Preferred Alternative Scheduled Acres (selected Management Areas)

Management Area	Acres Scheduled	Existing Harvest	Percent Harvested
S01	9124	0	0
S04	54806	18257	33
S07	9172	260	3
S08	3483	0	0
S09	22256	1650	7
S10	21861	3038	14
S11	27349	6786	25
S13	26820	2725	10
S14	218	0	0
S16	13036	2771	21
S17	20543	5663	28
S18	1918	1278	67
S19	32225	10052	31
S20	10694	1170	11
S21	3180	2300	72
S22	4020	884	22
S23	22779	3885	17
S24	1742	277	16
S25	22583	4648	21
S26	10743	100	1
S29	5426	2668	49
S31	2928	0	0
S32	304	140	46
S33	7215	1177	16
S35	11248	3455	31
STIKINE TOTAL	345673	73184	21

Table 9 (continued)
TLMP RSDEIS Preferred Alternative Scheduled Acres (selected Management Areas)

Management Area	Acres Scheduled	Existing Harvest	Percent Harvested
K01	16078	7414	46
K02	1844	872	47
K03	21030	11996	57
K04	5160	2459	48
K05	17681	11810	67
K07	40117	23194	58
K08	23347	9539	41
K09	23150	14113	61
K10	9199	3275	36
K11	14195	9793	69
K14	16935	1275	8
K15	11210	3082	27
K17	16358	8181	50
K18	18474	4803	26
K19	2204	0	0
K20	7385	1065	14
K21	8969	694	8
K22	2314	0	0
K24	6475	1101	17
K25	10239	0	0
K28	1947	0	0
K29	8871	152	2
K30	16571	919	6
K32	32776	7598	23
K34	1098	0	0
K35	18865	4657	25
K39	7316	458	6
K44	499	0	0
KTN. TOTAL	360307	128450	36

2. Cumulative Effects

The TLMP RSDEIS considers the cumulative effects for forest-wide acres managed for timber production for both the long-term and short-term timber sale programs. These effects are discussed at the end of their respective sections.

Analysis points to the need to schedule harvest in VCUs assigned management prescriptions which permit consideration of timber harvest, including the VCUs within the Upper Carroll Project Area. These VCUs in the current Forest plan, and in the draft revised Forest Plan would be needed to help meet KPC Contract volume needs, and TLMP and TTRA timber supply objectives. The forest-wide cumulative effects analysis in the TLMP RSDEIS supports the conclusion that this harvest can be accomplished within existing and proposed revised TLMP standards and guidelines and other requirements for resource protection.

3. Subsistence

With the passage of the ANILCA, Congress recognized the importance of subsistence resources to rural residents of Alaska. In particular, prior to any disposition of public lands, an agency must first complete a subsistence effects evaluation, including consideration of the availability of other lands (ANILCA 810 (a)).

Based on a review of available harvest volumes for each VCU in the KPC Sale Area and Contingency Area, it appeared that in order to meet contract volume commitments, most of the LUD III and IV VCUs would need some level of harvest prior to the end of the KPC contract in 2004. In addition, some volumes from outside of the primary and contigency sale areas would also need to made available to KPC contractual obligations. A tentative offering schedule was developed and approved for implementation based on this analysis. In short, almost all LUD III and IV VCUs in the KPC Long-term Sale Area and Contingency Area as well as those outside the Sale Area would be scheduled for harvest by the year 2004, indicating a level of impact to all subsistence use areas. However, the most significant impacts on the subsistence resource habitat would not occur until 20 to 30 years after the timber harvest when the second growth canopy closes. When those impacts to subsistence resources are viewed from a reference point 20 years in the future, the particular importance of which areas are scheduled first during a 5-year period appears to be minor. In considering communities that may be most affected by any proposed timber harvest in the Upper Carroll Project Area, Metlakatla, Meyers Chuck, Saxman, Wrangell, Thorne Bay, and Ketchikan appear to have the strongest cultural and subsistence ties to the area. Each community has its own level of reliance on subsistence as well as its own level of reliance on the Upper Carroll Project Area for supplying subsistence resources. The following information about each communities subsistence use is a summary of more detailed information provided in chapter 3 of the Upper Carroll Project EIS.

Metlakatla Boat access areas adjacent to or in the immediate vicinity of the Carroll estuary are some of the subsistence use areas for the community.

Meyers Chuck Boat access areas adjacent to or within the immediate vicinity of Neets Bay located in the Northwest portion of the Project Area is the subsistence use area used on a limited basis by the community.

Saxman Boat access areas adjacent to or in the immediate vicinity of the Carroll estuary as well as boat access areas adjacent to or within the immediate vicinity of Neets Bay located in the Northwest portion of the Project Area are some of the subsistence use areas for the community.

Wrangell Boat access areas adjacent to or within the immediate vicinity of Neets Bay located in the Northwest portion of the Project Area is the subsistence use area used on a limited basis by the community.

Thorne Bay Boat access areas adjacent to or within the immediate vicinity of Neets Bay located in the Northwest portion of the Project Area is the subsistence use area used on a limited basis by the community.

Ketchikan Boat access areas adjacent to or in the immediate vicinity of the Carroll estuary as well as boat access areas adjacent to or within the immediate vicinity of Neets Bay located in the Northwest portion of the Project Area are some of the subsistence use areas for the community.

As a result of several considerations, including the availability of subsistence resources in undisturbed areas of Revillia Island, including LUD I and LUD II areas within or adjacent to the Project Area (such as the Naha LUD II Area and the Cleveland Peninsula), the relative independence of most communities from subsistence resources in the Project Area, as well as analysis contained in the Tongass Land Management Plan RSDEIS, the Forest Service determined to schedule an environmental analysis of the Upper Carroll area. Other projects including Sea Level, North Revilla, Port Stewart, Vixen Inlet, Central Prince of Wales, Lab Bay, Ratz Harbor, Heceta Island, and Chasina are being implemented, or, will undergo environmental analysis within the next 3 to 5 years.

Extensive forestwide cumulative effect analysis has been included in the TLMP RSDEIS (TLMP SDEIS pages 3-628 through 3-765 and TLMP RSDEIS pages 3-328 through 3-441). That analysis, and the tables of data shown in appendix K of TLMP SDEIS and the maps shown in appendix c of the TLMP RSDEIS are incorporated by reference into this document. The data in appendix K and L indicates subsistence hunting of deer and other uses in virtually every area of the Tongass with substantial quantities of harvestable timber. The following information is extracted directly out of the Tongass Land Management Plan Revision, Supplement to the Draft Environmental Impact Statement, pages 3-762 and 3-763:

> In conducting the subsistence evaluation it is determined that, in combination with other past present and reasonably foreseeable future actions, none of the alternatives would pose a significant possibility of significant restriction for salmon, other finfish, marine mammals, invertebrates, plants, mountain goat, moose, waterfowl, sea birds, or other small game. Together these resources account for an average of 79 percent of the total harvest of subsistence resources (Kruse and Muth, 1990).
>
> In considering the impacts of future actions that may take place under the proposed alternatives on deer, two types of analysis was conducted. Potential effects were first determined for those WAAs where residents have successfully harvested deer, then for those WAAs where residents have ever gone to harvest deer. Both 10 percent and 20 percent harvest levels of the deer population were used.
>
> Considering only those WAAs where residents successfully harvested deer and assuming a harvest level of 10 percent of the population, there would be sufficient deer in all alternatives for the next 50 years to meet all subsistence needs for all communities except Gustavus, Hoonah, Kake, Pelican, Sitka, and Yakutat (appendix K). For these communities, there would be insufficient habitat capability to support harvest by all subsistence users (regardless of the community of orgin). However, at 20 percent of the population, all subsistence needs for these communities would be met by all alternatives for the next 50 years (appendix K).

If instead of considering only those WAAs in which hunters were successful, we consider all WAAs ever hunted by community residents, then there would be sufficient deer habitat capability to support all subsistence hunters in the WAAs used for hunting by all subsistence communities except for Pelican and Gustavus. If instead of assuming a 10 percent harvest level, a 20 percent harvest level is used, there would be sufficient habitat capability to support all subsistence harvest in all WAAs used for hunting by all subsistence communities.

As a result of the analysis of the impacts of projects that would be permissible under each of the alternatives considered for adoption in the Forest Plan, it has been determined that all of the alternatives, if all permissible projects were fully implemented, have the potential to impact subsistence uses of deer, brown bear, and furbearers (specifically martens) due to potential effects of projects on abundance/distribution, and competition.

The analysis shown in chapter 3 of this Project EIS is supported by the analysis shown above in the TLMP RSDEIS. The conclusion stated above, "it has been determined that all of the alternatives, if all of the permissible projects were fully implemented, have the potential to impact subsistence uses of deer. . .", supports the conclusion that any environmental analysis area within the Tongass would have a similar chance of having a significant possibility of a significant restriction on subsistence resources for Sitka Black-tailed deer, and other mammals.

The analysis for ANILCA section 810 are shown in the Subsistence section of chapter 3, in this EIS. The determinations made from the ANILCA section 810 analysis and findings will be a part of the Record of Decision for this project.

Forest Plan Implementation

Review of Available Volume

A review was conducted of each Managment Area for available volume. This analysis was based on computer inventories and Allowable Sale Quantity (ASQ) calculations from TLMP Draft Revision (1996).

All areas allocated to LUD III or IV under the current TLMP, as amended, and all areas available for timber harvest under the revised TLMP can be expected to entered for substantial timber harvest sometime in the future if the plan is to be fully implemented. The review used the following guidelines to identify likely areas to schedule for environmental analysis in the near future:

(1) Evaluate by area the total available volume within the suitable land base.

(2) Identify a tentative ten year sale schedule which addresses volume to be offered.

(3) Prepare a schedule of environmental analysis areas which shows how the Tongass will proceed through the end of ten year sale schedule.

The results of the first step by the working group analysis are presented in table 10. The results of this volume review, further supported by TLMP revision information, provided the basis for scheduling the next series of environmental analyses.

Table 10
Available Volume By Project

Timber Project Location and Projected Volume	Projected Volume	Tent. Suitable Acres	Previous Harvest Acres	Projected Project Acres
Chatham Area				
89 SEIS Analysis Area 2 VCUs 193;198 200;201;202;222;223		15,998	2,583 (16.2%)	1,305 (8.2%)
Kelp Bay EIS VCUs 291-294; 296-298; 314-315	117MMBF	22,584	4,781 (21.2%)	4,238 (18.8%)
Southeast Chichagof EIS MA 29;33;34; 36;37;37a & VCU 227-247	130MMBF	58,054	13,260 (22.8%)	3,765 (6.5%)
Ushk Bay EIS VCUs 279-281	67MMBF	5,070	38 (0.8%)	2,166 (42.7%)
Eight Fathom EIS VCUs 193-198; 200-202	130MMBF	16,645	1,806 (10.9%)	3,498 (21.0%)
Northwest Baranof EIS VCUs 287-292; 299-302	66MMBF	17,936	3,307 (18.4%)	2,500 (13.9%)
Port Houghton EIS VCUs 79-89	93MMBF	32,415	0 (0.0%)	3,100 (9.6%)
Indian River EIS VCUs 220-222	20MMBF	5,688	1,277 (22.5%)	660 (11.6%)
Whitestone EIS VCUs 205; 207-211	30MMBF	15,241	3,476 (22.8%)	900 (5.9%)
Moore Mountains EIS VCUs 227-246	67MMBF	48,118	11,465 (23.8%)	2,010 (4.2%)
Kennel Creek EIS VCUs 215-218	36MMBF	19,178	4,604 (24.0%)	1,170 (6.1%)
Windham EIS VCUs 68-70; 72-74	50MMBF	16,236	0 (0.0%)	1,500 (9.2%)
W.Baranof/Kruzof EIS VCUs 287; 299; 300;301;312;313;318-324	41MMBF	8,084	1,374 (17.0%)	1,400 17.3%)
Upper Tenakee EIS VCUs 202; 224-226	33MMBF	5,801	1,018 (17.6%)	990 (17.1%)
Neka Heli EIS VCUs 193-198; 200-201	37MMBF	12,973	788 (6.1%)	1,110 (8.6%)

Port Houghton II EIS VCUs 79-84	34MMBF	23,291	0 (0.0%)	1,020 (4.4%)
Couverden/Mansfield VCUs 116-123; 125-132	24MMBF	5,640	1,167 (20.7%)	720 (12.8%)
Stikine Aea				
North & East Kuiu EIS VCUs 398-402; 416-421	120MMBF	77,042	19,907 (25.8%)	5,203 (6.8%)
Bohemia EIS VCUs 424; 442	40MMBF	7,571	400 (5.3%)	1,381 (18.2%)
Campbell EIS VCU 510	8MMBF	830	0 (0.0%)	390 (47.0%)
Shamrock EIS VCUs 429;436;438	44MMBF	17,895	358 (2.0%)	1,500 (8.4%)
King George EIS VCU 462	27MMBF	3,611	240 (6.7%)	750 (20.8%)
Lindenberg EIS VCU 437	46MMBF	7,794	2,126 (27.3%)	1,560 (20.0%)
Canal/Hoya EIS VCUs 520-521	20MMBF	2,098	0 (0.0%)	600 (28.6%)
S. Zarembo EIS VCUs 458-459	20MMBF	15,718	3,854 (24.5%)	660 (4.2%)
S33 EIS VCUs 525-526	22MMBF	3,296	177 (5.4%)	700 (21.2%)
Scott Peak EIS VCUs 443;444;446	20MMBF	14,290	2,638 (18.5%)	600 (4.2%)
Mitkof Sales EIS VCUs 449-450	30MMBF	7,463	2,650 (35.5%)	1,000 (13.4%)
Crystal River EIS VCUs 486;487;489	16MMBF	10,666	3,315 (31.1%)	550 (5.2%)
Etolin EIS VCUs 462-469	50MMBF	21,876	3,885 (17.8%)	1,700 (7.8%)
Mad Critter EIS VCUs 501;502;504	25MMBF	10,723	100 (0.9%)	833 (7.8%)
Woronofski EIS VCU 461	11MMBF	4,006	820 (20.5%)	330 (8.2%)

Cape Fanshaw EIS VCUs 85-89	37MMBF	9,124	0 (0.0%)	1,200 (13.2%)
South Kupreanof EIS VCUs 430-434	28MMBF	10,694	1,170 (10.9%)	840 (7.9%)
Zarembo EIS VCUs 458-459	20MMBF	15,718	3,854 (24.5%)	600 (3.8%)
Woewodski EIS VCU 448	11MMBF	4,006	820 (20.5%)	330 (8.2%)
North Kupreanof EIS VCUs 424;443	22MMBF	9,438	799 (8.5%)	660 (7.0%)
Wrangell EIS VCUs 476-480;505	11MMBF	20,845	4,488 (21.5%)	370 (1.8%)
Ketchikan Area				
Central Prince of Wales EIS VCUs 557; 577;579-590;598-601.1;549.2-554; 571-574	267MMBF	87,529	47,862 (54.7%)	7,870 (9.0%)
North Revilla EIS VCUs 732;733;735-74	200MMBF	26,861	7,051 (26.3%)	6,485 (24.1%)
Polk Inlet EIS VCUs 610-613; 618-622 624;674;675	125MMBF	34,832	12,984 (37.3%)	4,116 (11.8%)
Lab Bay EIS VCUs 527-540;551	40MMBF	34,736	17,361 (50.0%)	1,400 (4.0%)
Control Lake EIS VCUs 574-578; 591-597.2	140MMBF	37,358	11,335 (30.3%)	4,700 (12.6%)
Upper Carroll EIS VCUs 737;744;746	40MMBF	10,076	2,960 (29.4%)	1,400 (13.9%)
Vixin Inlet EIS VCUs 708-710;718; 720;721	40MMBF	7,094	152 (2.1%)	1,400 (19.7%)
Ratz EIS VCUs 572; 579-585	10MMBF	23,150	14,113 (61.0%)	300 (1.3%)
Tuxekan EIS VCUs 554.2;556;557;560; 571	15MMBF	20,472	12,515 (61.1%)	500 (2.3%)
Chasina EIS VCUs 677-681	40MMBF	6,475	1,101 (17.0%)	1,400 (21.6%)
Sea Level EIS VCUs 746;753;755-757; 759	20MMBF	18,845	4,657 (24.7%)	600 (3.2%)
Port Stewart EIS VCUs 713-717;719;	35MMBF	16,571	919	1,200

722;723			(5.6%)	(7.2%)
Moira EIS VCUs 694;695;699; 700-704	40MMBF	10,293	0	1,400 (13.6%)
Chomley EIS VCUs 691-693	60MMBF	7,501	0	2,000 (26.7%)
South Prince of Wales EIS VCUs 694; 695;699; 700-704	36MMBF	7,565	0	1,200 (15.9%)
North Prince of Wales EIS MA K01;K03 K07;K08	90MMBF	98,812	51,157 (51.8%)	3,000 (3.0%)
Luck Lake EIS MA K08;K09	60MMBF	42,777	21,416 (50.1%)	2,000 (4.7%)
Lower Carroll EIS VCU 744	40MMBF	9,393	1,642 (17.5%)	1,400 (14.9%)
Cleveland EIS MA K29; K30	90MMBF	25,442	919 (3.6%)	3,000 (11.8%)
Dall Island EIS MA K22	25MMBF	2,314	0	750 (32.4%)
Sukkwan EIS MA K21	30MMBF	8,969	694 (7.7%)	1,000 (11.2%)
S. Revilla EIS VCUs 743;747;748	20MMBF	6,891	439 (6.4%)	600 (8.7%)
K-15 EIS MA K15	15MMBF	10,102	3,003 (29.7%)	500 (5.0%)
K-32 EIS MA K15	10MMBF	26,861	7,051 (26.3%)	350 (1.3%)

Analysis Area Reviews

For each area identified as having sufficient volume available to consider for further environmental analysis at this time, a review was conducted to decide which areas to schedule first, considering the current TLMP and proposed revised TLMP schedule, and other resource factors such as amount of past harvesting, log transfer facilities (LTF's) required, amount of road systems in place, amount of additional roads required, if in long term sale contract sale area and wildlife and recreation values. The results of this review appear below:

Table 11
Available Volume By Project

Timber NEPA Projects, Location, and Projected Offerings	Projected NEPA Process Dates	Projected Volume MMBF
Chatham Area		
89 SEIS Analysis Area 2 VCUs 193;198; 200;201;202;222;223	11/89 ROD;	
Kelp Bay EIS VCUs 291-294; 296-298; 314-315	3/1/90 NOI;2/92 ROD;	117
Southeast Chichagof EIS MA 29;33;34; 36;37;37a & VCU 227-247	5/2/90 NOI;8/92 ROD;	130
Ushk Bay EIS VCUs 279-281	9/94 ROD;	67
Eight Fathom EIS VCUs 193-198; 200-202	5/22/93 NOI 7/31/95 DEIS;3/96 ROD;	130
Northwest Baranof EIS VCUs 287-292; 299-302	6/1/2/93 NOI 7/21/95 DEIS;3/96 ROD;	66
Port Houghton EIS VCUs 79-89	9/12/94 NOI; 10/95 DEIS; 4/96 ROD;	93
Indian River EIS VCUs 220-222	1/96 NOI; 6/96 DEIS; 12/96 ROD;	20
Whitestone EIS VCUs 205; 207-211	'96 NOI; '96 DEIS; 5/97 ROD;	30
Moore Mountains EIS VCUs 227-246	'97 NOI; '98 DEIS; 1/99 ROD;	67
Kennel Creek EIS VCUs 215-218	'97 NOI; '98 DEIS; 5/99 ROD;	36
Windham EIS VCUs 68-70; 72-74	'98 NOI; '99 DEIS; 01/00 ROD;	50
W.Baranof/Kruzof EIS VCUs 287; 299; 300;301;312;313;318-324	'99 NOI; '00 DEIS; 01/01 ROD;	41
Upper Tenakee EIS VCUs 202; 224-226	'01 NOI; '02 DEIS; 01/03 ROD;	33
Neka Heli EIS VCUs 193-198; 200-201	'01 NOI; '02 DEIS; 05/03 ROD;	37

	'02 NOI;	
Port Houghton II EIS VCUs 79-84	'03 DEIS; 05/04 ROD;	34
Couverden/Mansfield VCUs 116-123; 125-132	'03 NOI; '04 DEIS; 01/05 ROD;	24
Stikine Area		
North & East Kuiu EIS VCUs 398-402; 416-421	6/90 NOI; 1/20/93 ROD;	120
Bohemia EIS VCUs 424; 442	4/95 ROD;	40
Campbell EIS VCU 510	9/29/93 ROD;	8
Shamrock EIS VCUs 429;436;438	5/96 ROD;	44
King George EIS VCU 462	12/93 NOI; 5/96 ROD;	27
Lindenberg EIS VCU 437	7/93 NOI; 4/96 ROD;	46
Canal/Hoya EIS VCUs 520-521	'96 NOI; 9/96 DEIS; 12/96 ROD;	20
Houghton/Fanshaw EIS (NEPA shown on Pt. Houghton EIS)		
S. Zarembo EIS VCUs 458-459	'96 NOI; '97 DEIS; 10/98 ROD;	20
S33 EIS VCUs 525-526	'96 NOI; '97 DEIS; 10/98 ROD;	22
Scott Peak EIS VCUs 443;444;446	'96 NOI; '97 DEIS; 10/97 ROD;	20
Mitkof Sales EIS VCUs 449-450	'96 NOI; '97 DEIS; 10/97 ROD;	30
Crystal River EIS VCUs 486;487;489	'96 NOI; '97 DEIS; 10/98 ROD;	16
Etolin EIS VCUs 462-469	'96 NOI; '97 DEIS; 10/98 ROD;	50
Mad Critter EIS VCUs 501;502;504	'96 NOI; '97 DEIS; 10/98 ROD;	35
Woronofski EIS VCU 461	'97 NOI; '98 DEIS; 10/99 ROD;	10
Cape Fanshaw EIS VCUs 85-89	'97 NOI; '98 DEIS; 10/99 ROD;	37
South Kupreanof EIS VCUs 430-434	'98 NOI; '99 DEIS; 10/00 ROD;	28
Zarembo EIS VCUs 458-459	'99 NOI; '00 DEIS; 10/01 ROD;	20
Woewodski EIS VCU 448	'00 NOI; '01 DEIS; 10/02 ROD;	11
	'00 NOI;	

North Kupreanof EIS VCUs 424;443	'01 DEIS; 10/02 ROD;	22
Wrangell EIS VCUs 476-480;505	'00 NOI; '01 DEIS; 10/02 ROD;	20
Ketchikan Area		
Central Prince of Wales EIS VCUs 557; 571-574; 577;579-590;598-601.1; 549.2-554	8/91 NOI; 7/93 ROD;	267
North Revilla EIS VCUs 732;733;735-740	4/91 NOI; 8/93 ROD;	200
Polk Inlet EIS VCUs 610-613; 618-622; 624;674;675	9/91 NOI; 3/95 ROD;	125
Lab Bay EIS VCUs 527-540;551	9/92 NOI; 7/95 DEIS; 8/96 ROD;	40
Control Lake EIS VCUs 574-578; 591-597.2	10/93 NOI; 9/95 DEIS; 6/96 ROD;	140
Upper Carroll EIS VCUs 737;744;746	6/94 NOI; 9/95 DEIS; 6/96 ROD;	40
Vixin Inlet EIS VCUs 708-710;718; 720;721	5/97 NOI; 12/97 DEIS; 12/98 ROD;	40
Ratz EIS VCUs 572; 579-585	5/97 NOI; 12/97 DEIS; 12/98 ROD;	10
Tuxekan EIS VCUs 554.2;556;557;560; 571	5/97 NOI; 12/97 DEIS; 12/98 ROD;	15
Chasina EIS VCUs 677-681	11/95 NOI; 7/96 DEIS; 4/97 ROD;	40
Sea Level EIS VCUs 746;753;755-757; 759	5/96 NOI; 11/97 DEIS; 12/98 ROD;	20
Port Stewart EIS VCUs 713-717;719; 722;723	4/97 NOI; 12/97 DEIS; 12/98 ROD;	35
Moira EIS VCUs 694;695;699; 700-704	'98 NOI; '99 DEIS; '00 ROD;	40
Chomley EIS VCUs 691-693	'98 NOI; '99 DEIS; '00 ROD;	60
South Prince of Wales EIS VCUs 694; 695;699; 700-704	'99 NOI; '00 DEIS; '01 ROD;	36
North Prince of Wales EIS MA K01;K03; K07;K08	'99 NOI; '00 DEIS; '01 ROD;	90
Luck Lake EIS MA K08;K09	'99 NOI; '00 DEIS; '01 ROD;	60

Lower Carroll EIS VCU 744	'00 NOI; '01 DEIS; '02 ROD;	40
Cleveland EIS MA K29; K30	'01 NOI; '02 DEIS; '03 ROD;	90
Dall Island EIS MA K22	'02 NOI; '03 DEIS; '04 ROD;	25
Sukkwan EIS MA K21	'02 NOI; '03 DEIS; '04 ROD;	30
S. Revilla EIS VCUs 743;747;748	'02 NOI; '03 DEIS; '04 ROD;	20
K-15 EIS MA K15	'02 NOI; '03 DEIS; '04 ROD;	15
K-32 EIS MA K15	'02 NOI; '03 DEIS; '04 ROD;	10

Upon completion of the above analysis, several project areas were identified and scheduled for environmental analysis first. Those projects were initiated which had a high priority. In addition to project area's relative ability to provide timber, other factors considered in scheduling the Upper Carroll Project for environmental analysis at this time with an associated, projected approximate timber volume included: (1) this harvest level is consistent with the sale schedule in the TLMP (1979a, as amended); (2) sufficient volume has been determined to be available in the project area; (3) there is a limited road network in place; (4) the number and location of Log Transfer Facilities (LTF's) is sufficient to handle this volume of timber within a three-year time frame; (5) there are existing logging camps within the area to handle this volume; and (6) the current Forest Plan (TLMP 1979a, as amended) provides for harvest in this project area. Harvest in the project area is also consistent with proposed land allocation in the preferred alternative in TLMP Revision RSDEIS.

Substantial changes in timber demand or other circumstances could affect the rate at which various areas proceed through the NEPA process or the timing of actual timber sale offerings, but are not expected to change the sequence for initiating and completing the NEPA process for various areas. Time periods of relatively low market demand provide an opportunity to increase available timber supply in anticipation of cyclical higher demand periods. All areas in which commercial timber harvest is authorized under the existing or revised TLMP are expected to receive some level of timber harvest at some time if the Forest Plan is to be fully implemented. Total environmental impacts viewed in the long term are not expected to differ substantially depending upon the order in which different areas are entered. The "No-Action" Alternative of not proceeding with further harvest at the present is considered in detail in each timber sale project NEPA process. But generally, projects farthest along in the NEPA process are the most efficient and logical to consider for implementation first in order to meet timber supply, timber sale program, and Forest Plan objectives.

Appendix B

Units Greater than 100 Acres

APPENDIX B

Appendix B
Harvest Units Over 100 Acres in Size
By Alternative

NFMA regulations provide that 100 acres is the maximum size of created openings to be allowed for the western hemlock-Sitka spruce forest type of coastal Alaska, unless excepted under specific conditions. The Alaska Regional Guide (page 3-20) provides---

> Recognizing that harvest units must be designed to accomplish management goals, created openings may be larger where larger units will produce a more desirable contribution of benefits. Factors to be considered to determine when a larger size may be permitted are:
>
> 1. Topography
> 2. Relationship of units to other natural or artificial openings and proximity of units
> 3. Coordination and consistency with adjacent management areas
> 4. Effect on water quality and quantity
> 5. Visual absorption capacity
> 6. Effect on wildlife and fish habitat
> 7. Regeneration requirements for desirable tree species, based upon latest research
> 8. Transportation and harvesting system requirements
> 9. Natural and biological hazards to the survival of residual trees and surrounding stands
> 10. Relative total costs of preparation, logging, and administration of harvest cuts
>
> Where it is determined by the interdisciplinary team that exceptions to the size limitation are warranted, the actual size limitation of openings may be up 100 percent greater for factor 9 and up to 50 percent greater for all other factors with the approval of the Forest Supervisor.
>
> Exceptions to the 100 acre size limit in excess of 50 percent greater (100 percent greater for factor 9) are permitted on an individual timber sale basis after 60 days public notice. and review and approval by the Regional Forester.

The following tables display the units by alternative which exceed 100 acres in size. The reason for exceeeding the size limits are also displayed.

Units Over 100 Acres in Size

HARVEST UNIT#	ACRES	REASON	ALTERNATIVE NUMBER 2	3	5	6	7
16	106	1, 8, 9 and10	2	3	5		
3/27/28/142	110	1, 8, 9 and10			5		
*120	20	1, 2 and 9	2	3			
Number of Uinits Over 100 Acres by Alternative			1	1	2	0	0

* Unit 120 is adjacent to an existing created opening (Shelter Cove Sale). The resulting opening will be approximately 135 acres for 2-3 years after harvest until green-up is achieved in the Shelter Cove units. Existing windthrow indicates a need to tie the boundaries together.

Appendix C

Riparian Area Prescriptions

RIPARIAN AREA PRESCRIPTIONS

RP LUDs

The Riparian Area Land Use Designation (RP) is applied where more development-oriented riparian management would otherwise normally occur. At a minimum, the land area encompassed by this designation includes: 1) the riparian area required to meet the National Forest Management Act's implementing regulations for fish habitat and water quality; and, 2) the land area in which the commercial timber harvest restrictions of the Tongass Timber Reform Act (P.L. 101-931) are applied. Risks of effects to riparian resources are reduced by extending the Riparian Area Land Use Designation to beyond the area required by law.

Goals

To maintain riparian habitat for fish and other riparian-associated species and resources.

To meet the requirements of the National Forest Management Act and the Tongass Timber Reform Act for the protection of fish habitat and/or water quality.

Objectives

To emphasize the maintenance and improvement of fish habitat and populations by integrating aquatic and terrestrial ecosystems management.

Manage the habitat for riparian-associated wildlife species in Class I stream and lake areas to achieve old-growth characteristics.

Prohibit commercial timber harvest within 100 feet of either side of Class I streams, and within 100 feet of those Class II streams which flow directly into Class I streams. Allow timber harvest in other areas where it does not conflict with the maintenance or improvement of riparian-associated resources.

Objectives for fish habitat management:

- Maintain or improve fish habitat capability;
- Maintain natural stream bank and stream channel processes;
- Maintain natural and beneficial quantities of large woody debris over the short- and long-term;
- Maintain water quality to provide for fish production;
- Maintain optimum water temperatures for salmonids;
- Maintain or improve primary or secondary stream biological production in second-growth forests;
- Maintain fish passage through stream crossing structures.

Accommodate recreation facilities and uses associated with water-related activities which avoid adverse effects on water quality and riparian shorelines.

Desired Future Condition

Riparian areas throughout the forest provide high-quality habitat for fish and riparian-associated wildlife species. A wide variety of vegetative conditions and

types are present, benefiting a variety of species; also provided are reserve trees for wildlife, large trees for brown bear bedding areas, and associated waterfowl habitats. The areas also provide wildlife travel corridors.

Timber Harvest Prescription

The following tables provide the standards and guidelines for timber harvest activities. Distances are in slope distance measured from the ordinary high water mark (see glossary). Distances shown are for windfirm leave strips; greater distance may be required to achieve reasonable assurance that windthrow as the result of adjacent harvest activity will not occur within the windfirm distance. To design windfirm leave strips, consider conditions such as soils, local wind patterns, tree height and size, and other site-specific factors. Forest-wide and Land Use Designation-wide standards and guidelines apply for each channel process group.

Harvest Definitions

"no commercial timber harvest" - A standard that means commercial timber harvest shall be prohibited (Tongass Timber Reform Act of 1990)).

"no programmed commercial timber harvest" - A guideline and means that no timber harvest will be scheduled, but that unprogrammed commercial timber harvest could be allowed. Among other reasons, unprogrammed commercial timber harvest may include timber sold as part of a salvage sale, for insect and disease abatement purposes, and for specialty wood products.)

Flood Plain Process Group
(Channel types FP1, FP2, FP3, FP4, FP5)

Stream Class

	I
Objectives	- Maintain or improve aquatic biological productivity - Assure the protection of riparian habitat - Allow no measurable reduction in short habitat capability except when change is a result of natural processes - Restore stream and/or watershed condition where habitat capability has been reduced from the natural capability - Maintain/manage old-growth characteristic habitat for riparian-associated wildlife species - Maintain long-term supplies of large woody debris sources within the process group - Allow no activities which may cause floodplain destabilization
Harvest Control	- Allow no commercial timber harvest within 100 feet in width on each side of all channel types - Allow single tree selection harvest within 100 to 200 feet in width on each side of FP3 channel types not associated with other channel types - Allow no programmed commercial timber harvest within 100 to 200 feet in width on each side for remainder of channel types - Consider all harvest methods, on a case-by-case basis, in the riparian area beyond 200 feet if the riparian area is greater than 200 feet
Harvest Rate	- Beyond 100 feet from the stream, strive to maintain 90% of the normal basal area with trees 16"+ dbh within areas with no programmed commercial timber harvest.
Salvage	- Allow no salvage in the "no commercial timber harvest" areas unless needed to meet process group objectives (e.g., windthrown trees restricting fish passage in streams) - Allow salvage in other areas while meeting objectives
Roading	- Locate roads in this process group only when other reasonably feasible routes do not exist.

NOTES:

- A primary consideration for timber harvest within this Land Use Designation is to maintain windfirmness of the unharvested trees. Where additional distance is required to provide for reasonable assurance of windfirmness, harvest may be allowed, but will be limited to uneven-aged silvicultural systems.
- Commercial timber harvest guidelines beyond 100 feet may vary, based on site-specific analysis, but must meet process group objectives.
- Beyond 100 feet of the stream, incidental cutting of trees may be allowed in areas not programmed for commercial timber harvest on a case-by-case basis (e.g., for bridge stringers, totem poles, etc.).
- Stream Classes II and III do not normally occur in this process group. If they should occur, harvest control must meet management objectives for Class II and III of the Alluvial Fan Process Group.

Alluvial Fan Process Group
(Channel types AF1, AF2, AF8)

	Stream Class		
	I	II	III
Objectives	- Allow no activities which may cause floodplain destabilization - Assure the protection of riparian habitat - Maintain or improve aquatic biological productivity - Allow no measurable reduction in smolt habitat capability except when change is a result of natural processes - Restore stream and/or watershed condition where habitat capability has been reduced from the natural capability - Maintain/manage old-growth characteristic habitat for riparian-associated wildlife species	- Allow no activities which may cause floodplain destabilization - Assure the protection of riparian habitat - Maintain habitat capability for resident fish to the extent practicable	- Allow no activities which may cause floodplain destabilization - Assure the protection of riparian habitat - Minimize the effects of timber harvest and related land disturbance activities on the beneficial uses of water by applying Best Management Practices.
Harvest Control	- Allow no commercial timber harvest within active portion of fan or 100 feet of channel, whichever is greater - All harvest methods are available on remaining inactive portion of fan while meeting objectives	- Allow no commercial timber harvest within active portion of fan or 100 feet of channel, if the stream flows directly into a Class I stream (25 feet if not tributary to a Class I stream). - All harvest methods are available on remaining inactive portion of fan while meeting objectives - Allow single tree selection harvest within 25 to 60 feet from streambank if not within active portion of fan and not flowing directly into a Class I stream.	- Allow no programmed commercial timber harvest within active portion of fan or 25 feet of streambank, whichever is greater - All harvest methods are available on remaining inactive portion of fan while meeting objectives

Stream Class

	I	II	III
Harvest Rate	- Beyond 100 feet of the stream, strive to maintain 90% of the normal basal area with trees 16"+ dbh within areas with "no programmed commercial timber harvest" (see note below)	- Harvest should not exceed 50% of the forest land of individual fan. Remaining forested land is not to be harvested until created openings contain 50 foot tall conifer trees (approximately 30 yrs.)	
Salvage	- Allow no salvage in the no commercial timber harvest area unless needed to meet process group objectives (e.g., windthrown trees restricting fish passage in streams) - Allow salvage in other areas while meeting objectives		- Allow salvage in all areas while meeting objectives
Roading	- Anticipate unstable stream channels in determining the feasibility and/or most practical road locations, stream crossings, and design.		

NOTES:

- A primary consideration for timber harvest within this Land Use Designation is to maintain windfirmness of the unharvested trees. Where additional distance is required to provide for reasonable assurance of windfirmness, harvest may be allowed but will be limited to uneven-aged silvicultural systems.
- Except within 100 feet of a Class I stream and 100 feet of a Class II stream which flows directly into a Class I stream, commercial timber harvest guidelines may vary, based on site-specific analysis, but must meet process group objectives.
- Except within 100 feet of a Class I stream and 100 feet of a Class II stream which flows directly into a Class I stream, incidental cutting of trees may be allowed in areas not programmed for commercial timber harvest on a case-by-case basis (e.g. for bridge stringers, totem poles, etc.).

Moderate Gradient Mixed Control Process Group
(Channel types MM1, MM2)

	Stream Class		
	I	II	III
Objectives	- Assure protection of riparian habitat. - Allow no activities which may cause floodplain destabilization. - Maintain or improve aquatic biological productivity - Allow no measurable reduction in smolt habitat capability except when change is a result of natural processes - Restore stream and/or watershed condition where habitat capability has been reduced from the natural capability - Maintain/manage old-growth characteristic habitat for riparian-associated wildlife species	- Assure protection of riparian habitat. - Allow no activities which may cause floodplain destabilization - Maintain habitat capability for resident fish to the extent practicable	- Assure protection of riparian habitat. - Allow no activities which may cause floodplain destabilization. - Minimize the effects of timber harvest and related land disturbance activities on the beneficial uses of water by applying Best Management Practices.
Harvest Control	- Allow no commercial timber harvest within 100 feet of channels. - Allow single tree selection on remainder of the area.	- Allow no commercial timber harvest within 100 feet of streams which flow directly into Class I streams. For other streams, allow single tree selection harvest within 25 feet of MM1 channels and 60 feet of MM2 channels. - All harvest methods are available on remaining area; where timber harvest is allowed within 100 feet of the stream, final harvest should incorporate undulating unit boundaries to limit the amount of continuous disturbance parallel to the streambank	- Allow single tree selection within 25 feet of MM1 channels - All harvest methods are available on remaining area while meeting objectives

Stream Class

	I	II	III
Harvest Rate	- Forest-wide Standards and Guidelines for timber apply		
Salvage	- Allow no salvage in the 'no commercial timber harvest areas' unless needed to meet process group objectives (e.g., windthrown trees restricting fish passage in streams) - Allow salvage in all areas while meeting objectives - Allow salvage in other areas while meeting objectives		
Roading	- Special road construction techniques may be required to ensure fish passage		

NOTES:

- A primary consideration for timber harvest within this Land Use Designation is to maintain windfirmness of the unharvested trees. Where additional distance is required to provide for reasonable assurance of windfirmness, harvest may be allowed but will be limited to uneven-aged silvicultural systems.
- Except within 100 feet of a Class I stream and 100 feet of a Class II stream which flows directly into a Class I stream, commercial timber harvest guidelines may vary, based on site-specific analysis, but must meet process group objectives.
- Except within 100 feet of a Class I stream and 100 feet of a Class II stream which flows directly into a Class I stream, incidental cutting of trees may be allowed in areas not programmed for commercial timber harvest on a case-by-case basis (e.g. for bridge stringers, totem poles, etc.).

Large Contained Process Group
(Channel types LC1, LC2)

	Stream Class I	Stream Class II
Objectives	- Maintain or improve aquatic biological productivity - Assure the protection of riparian habitat - Allow no activities which may cause floodplain destabilization - Allow no measurable reduction in smolt habitat capability except when change is a result of natural processes - Maintain/manage old-growth characteristic habitat for riparian-associated wildlife species	- Maintain habitat capability for resident fish to the extent practicable - Assure the protection of riparian habitat - Allow no activities which may cause flood-plain destabilization
Harvest Control	- Allow no commercial timber harvest within 100 feet - All harvest methods are available on remaining area while meeting objectives - Full suspension yarding is required to cross stream channel	- Allow no commercial timber harvest within 100 feet of streams which flow directly into Class I streams - Allow no programmed commercial timber harvest within 25 feet of other streams - All silvicultural systems are available on remaining area while meeting objectives - Minimize soil disturbance associated with yarding within inner gorge - Full suspension yarding is required to cross stream channel
Salvage	- Allow no salvage in the "no commercial timber harvest" areas unless needed to meet process group objectives (e.g., windthrown trees restricting fish passage in streams) - Allow salvage in other areas while meeting objectives	
Roading	- Road construction is generally not appropriate in this process group; where road crossings are required, minimize erosion and sedimentation associated with road crossing approaches within inner gorge	

NOTES:

- A primary consideration for timber harvest within the Land Use Designation is to maintain windfirmness of the unharvested trees. Where additional distance is required to provide for reasonable assurance of windfirmness, harvest may be allowed but will be limited to uneven-aged silvicultural systems.
- Except within 100 feet of a Class I stream and 100 feet of a Class II stream which flows directly into a Class I stream, commercial timber harvest guidelines may vary, based on site-specific analysis, but must meet process group objectives.
- Except within 100 feet of a Class I stream and 100 feet of a Class II stream which flows directly into a Class I stream, incidental cutting of trees may be allowed in areas not programmed for commercial timber harvest on a case-by-case basis (e.g. for bridge stringers, totem poles, etc.).
- Stream Class III does not normally occur in this process group. If it should occur, Harvest Control must meet Management Objectives for Class III of the Moderate Gradient Contained Process Group.

Moderate Gradient Contained Process Group
(Channel types MC1, MC2, MC3)

Stream Class

	I	II	III
Objectives	- Assure the protection of riparian habitat - Allow no activities which may cause floodplain destabilization - Maintain or improve aquatic biological productivity - Allow no measurable reduction in smolt habitat capability except when change is a result of natural processes - Restore stream and/or watershed condition where habitat capability has been reduced from the natural capability - Maintain/manage old-growth characteristic habitat for riparian-associated wildlife species	- Assure the protection of riparian habitat - Allow no activities which may cause floodplain destabilization - Maintain habitat capability for resident fish to the extent practicable	- Assure the protection of riparian habitat - Allow no activities which may cause floodplain destabilization - Minimize the effects of timber harvest and related land disturbance activities on the beneficial uses of water by applying Best Management Practices.
Harvest Control	- Allow no commercial timber harvest within 100 feet - Beyond 100 feet, selectively leave trees with crowns that do not extend above the slope break - Minimize soil disturbance associated with yarding within the inner gorge - Full suspension yarding required to cross stream channel - Maintain near-natural reserve tree component of stand	- Allow no commercial timber harvest within 100 feet of streams which flow directly into Class I streams - Selectively leave trees with crowns that do not extend above the slope break along streams which do not flow directly into Class I streams, and beyond 100 feet for other streams - Minimize soil disturbance associated with yarding within inner gorge - Full suspension yarding required to cross stream channel	- All harvest methods are available while meeting objectives - Minimize soil disturbance associated with yarding within the inner gorge.

Stream Class

	I	II	III
Salvage	- Allow no salvage in the 'no commercial timber harvest areas' unless needed to meet process group objectives (e.g., windthrown trees restricting fish passage in streams)		- Allow salvage in other areas while meeting objectives
Roading	- Where road crossings are required, minimize erosion and sedimentation associated with road crossing approaches within the inner gorge		

NOTES:

- A primary consideration for timber harvest within this Land Use Designation is to maintain windfirmness of the unharvested trees. Where additional distance is required to provide for reasonable assurance of windfirmness, harvest may be allowed but will be limited to uneven-aged silvicultural systems.
- Except within 100 feet of a Class I stream and 100 feet of a Class II stream which flows directly into a Class I stream, commercial timber harvest guidelines may vary, based on site-specific analysis, but must meet process group objectives.
- Except within 100 feet of a Class I stream and 100 feet of a Class II stream which flows directly into a Class I stream, incidental cutting of trees may be allowed in areas not programmed for commercial timber harvest on a case-by-case basis (e.g. for bridge stringers, totem poles, etc.).

High Gradient Contained Process Group
(Channel types HC1, HC2, HC3, HC4, HC5, HC6, HC8, HC9)

	Stream Class	
	II	III
Objectives	- Maintain habitat capability for resident fish to the extent practicable - Assure the protection of riparian habitat - Allow no activities which may cause floodplain destabilization.	- Minimize the effects of timber harvest and related land disturbance activities on the beneficial uses of water by applying Best Management Practices. - Assure the protection of riparian habitat - Allow no activities which may cause floodplain destabilization
Harvest Control	- Allow no commercial timber harvest within 100 feet of streams which flow directly into Class I streams - Selectively leave trees with crowns that do not extend above the slope break along streams which do not flow directly into Class I streams and beyond 100 feet for other streams. - Minimize soil disturbance associated with yarding within inner gorge. - Full suspension yarding required to cross stream channel.	- Allow harvest to streambank while meeting objectives - Full suspension required to cross stream channel
Harvest Rate	- Harvest rate not to exceed 25% of the acres every 20 years of a 3rd order or larger watershed. (Note: this guideline applies only to those acres associated with this LUD)	
Salvage	- Allow no salvage in the "no commercial timber harvest areas" unless needed to meet process group objectives (e.g., windthrown trees restricting fish passage in streams) - Allow salvage in other areas while meeting objectives.	- Allow salvage while meeting objectives

NOTES:
- Commercial timber harvest guidelines may vary, based on site-specific analysis, but must meet process group objectives.
- Stream Class I does not normally occur in this process group. If they should occur, Harvest Control must meet Management Objectives for Class I of the Moderate Gradient Contained Process Group.

Palustrine Process Group
(Channel types PA1, PA2, PA3, PA4, PA5)

Stream Class

	I	II
Objectives	- Maintain or improve aquatic biological productivity - Assure the protection of riparian habitat - Allow no activities which may cause floodplain destabilization - Restore stream and/or watershed condition where habitat capability has been reduced from the natural capability - Allow no measurable reduction in smolt habitat capability except when change is a result of natural processes - Maintain/manage old-growth characteristic habitat for riparian-associated wildlife species	- Maintain habitat capability for resident fish to the extent practicable - Assure the protection of riparian habitat - Allow no activities which may cause floodplain destabilization
Harvest Control	- Allow no commercial timber harvest within 100 feet - Allow no programmed commercial timber harvest beyond 100 feet	- Allow no commercial timber harvest within 100 feet of streams which flow directly into Class I streams - Allow no programmed commercial timber harvest along other streams and, for all streams, beyond 100 feet
Salvage	- Allow no salvage in the 'no commercial timber harvest areas' unless needed to meet process group objectives (e.g., windthrown trees restricting fish passage in streams) - Allow salvage in other areas using non-ground disturbing methods, while meeting objectives e.g. helicopter)	
Roading	- Wetland values should receive special consideration in locating roads.	

NOTES:

- A primary consideration for timber harvest within this Land Use Designation is to maintain windfirmness of the unharvested trees. Where additional distance is required to provide for reasonable assurance of windfirmness, harvest may be allowed but will be limited to uneven-aged silvicultural systems.
- Except within 100 feet of a Class I stream and 100 feet of a Class II stream which flows directly into a Class I stream, commercial timber harvest guidelines may vary, based on site-specific analysis, but must meet process group objectives.
- Except within 100 feet of a Class I stream and 100 feet of a Class II stream which flows directly into a Class I stream, incidental cutting of trees may be allowed in areas not programmed for commercial timber harvest on a case-by-case basis (e.g. for bridge stringers, totem poles, etc.).
- Stream Class III does not normally occur in this process group. If it should occur, Harvest Control must meet Management Objectives for Class III of the Moderate Gradient Contained Process Group.

Lakes and Ponds
(Channel types not classified as streams)

	Stream Class		
	I	II	III
Objectives	- Maintain or improve aquatic biological productivity	- Maintain habitat capability for resident fish to the extent practicable	- Minimize the effects of timber harvest and related land disturbance activities on the beneficial uses of water by applying Best Management Practices.
	- Assure the protection of riparian habitat - Restore stream and/or watershed condition where habitat capability has been reduced from the natural capability - Allow no measurable reduction in smolt habitat capability except when change is a result of natural change - Maintain/manage old-growth characteristic habitat for riparian-associated wildlife species	- Assure the protection of riparian habitat	- Assure the protection of riparian habitat
Harvest Control	- Allow no commercial timber harvest within 100 feet	- Allow no commercial timber harvest within 100 feet in width of lakes and ponds which: 1) flow directly into a Class I stream, or 2) flow into a Class II stream which flows directly into a Class I stream	- Maintain a minimum of 50% of natural shading vegetation for temperature sensitive lakes
	- Allow uneven-aged management 100 to 500 feet of lake or pond, or the extent of this LUD, whichever is less	- For lakes and ponds not flowing directly into a Class I stream, allow uneven-aged management within 100 feet of lakes and ponds less 50 acres	
	- Any silvicultural system applies for remainder of area while meeting objectives.	- Allow uneven-aged management 100 to 500 feet, or extent of land use designation whichever is less, of lakes greater than 50 acres - Any silvicultural systems apply for the remainder of the area while meeting objectives	- All silvicultural systems available while meeting objectives
		- Treat as the adjacent LUD if lake or pond is less than 5 acres	- Treat as the adjacent LUD if lake or pond is less than 5 acres

	Stream Class		
	I	II	III
Salvage	- Allow no salvage in the "no commercial timber harvest areas" unless needed to meet process group objectives (e.g., windthrown trees restricting fish passage in streams) - Allow salvage in other areas while meeting objectives		- Allow salvage in all areas while meeting objectives
Roading	- Roads may be allowed if other practical alternatives are not available or if needed to access the water body for recreation or other needs		

NOTE:

- A primary consideration for timber harvest within this Land Use Designation is to maintain windfirmness of the unharvested trees. Where additional distance is required to provide for reasonable assurance of windfirmness, harvest may be allowed but will be limited to uneven-aged silvicultural systems.
- Except within 100 feet of a Class I stream and 100 feet of a Class II stream which flows directly into a Class I stream, commercial timber harvest guidelines may vary, based on site-specific analysis, but must meet process group objectives.
- Except within 100 feet of a Class I stream and 100 feet of a Class II stream which flows directly into a Class I stream, incidental cutting of trees may be allowed in areas not programmed for commercial timber harvest on a case-by-case basis (e.g. for bridge stringers, totem poles, etc.).

Estuarine Process Group*
(Channel types ES1, ES2, ES3, ES4, ES8)

	Stream Class I
Objectives	- Maintain or improve aquatic biological productivity - Assure the protection of riparian habitat - Allow no measurable reduction in smolt habitat capability except when change is a result of natural processes - Restore stream and/or watershed condition where habitat capability has been reduced from the natural capability - Maintain/manage old-growth characteristic habitat for riparian-associated wildlife species
Harvest Control	- Allow no commercial timber harvest within 100 feet - Allow no programmed commercial timber harvest within 100 to 500 feet of ES4 and ES8 estuarine channels, or the extent of this Land Use Designation, whichever is less - Allow no programmed commercial timber harvest within 100 to 200 feet of ES2 and ES3 estuarine channels, or the extent of this Land Use Designation, whichever is less - Allow uneven-aged silvicultural system for remainder of area
Harvest Rate	- Beyond 100' from the stream, strive to maintain 90% of the normal basal area with trees 16"+ dbh within areas with no programmed commercial timber harvest (see note below)
Salvage	- Allow no salvage in the "no commercial timber harvest areas" unless needed to meet process group objectives (e.g., windthrown trees restricting fish passage in streams) - Allow salvage in other areas while meeting objectives
Roading	- Juvenile fish passage may require special attention - Generally, no roading should occur in estuarine wetland areas

NOTES:

* This area is often covered by the Beach Fringe and Estuarine Forestwide Standards and Guidelines which would take precedence over management under the Riparian Area Prescription.

- A primary consideration for timber harvest within this Land Use Designation is to maintain windfirmness of the unharvested trees. Where additional distance is required to provide for reasonable assurance of windfirmness, harvest may be allowed but will be limited to uneven-aged silvicultural systems.
- Commercial timber harvest guidelines beyond 100 feet may vary, based on site-specific analysis, but must meet process group objectives.
- Beyond 100 feet of the stream, incidental cutting of trees may be allowed in areas not programmed for commercial timber harvest on a case-by-case basis (e.g., for bridge stringers, totem poles, etc.).
- Stream Classes II and III do not normally occur in this process group. If they should occur, Harvest Control must meet Management Objectives for Class II and III of the Lakes and Ponds Process Group.

Appendix D

Biological Assessment

BIOLOGICAL ASSESSMENT and BIOLOGICAL EVALUATION
for the Upper Carroll Project Area

June 1996

Prepared by Kerry A. Burns
Wildlife Biologist, Ketchikan Ranger District

Approved by: D. C. Crocker-Bedford Date: July 1, 1996
Cole Crocker-Bedford
Wildlife Biologist, Ketchikan Area, Tongass National Forest

BIOLOGICAL ASSESSMENT and BIOLOGICAL EVALUATION for the Upper Carroll Project Area

June 1996

This combined draft Biological Assessment and Biological Evaluation was prepared for the Upper Carroll Project Area as required by Section 7 of the Endangered Species Act (as amended) and the USDA Forest Service threatened, endangered, and sensitive plant and animal species policy (FSM 2670). This document describes the occurrence of and project effects on species that are Federally listed or proposed for threatened or endangered status. Although not required, plant and animal species of concern within the Project Area are also addressed. This document also serves as a BE by including equivalent information on Forest Service-listed sensitive species. The BE is not required under ESA, but is required by the Forest Service for all internal programs and activities (FSM 2672.4).

An Environmental Impact Statement is being prepared for the Upper Carroll Project Area. The action includes the harvest of approximately 1,100 to 2,600 acres of old-growth forest, construction of 25-70 miles of new roads, the use of three existing log transfer facilities, and the construction of one new log transfer facility. The Upper Carroll Project Area includes 47,997 acres, approximately 25 air miles north of Ketchikan, Alaska. It encompasses an area of northcentral Revillagigedo (Revilla) Island, from Carroll Inlet to Neets Bay. The Project Area includes Wildlife Analysis Areas (WAA's) 406 and 510.

This BA/BE addresses 33 plant and animal species. It covers the endangered humpback whale (*Megapter novaeangliae*), Snake River sockeye salmon (*Oncorhynchus nerka*), and the Eskimo curlew (*Numenius borealis*); the threatened American peregrine falcon (*Falco peregrinus anatum*), Aleutian Canada goose (*Branta canadensis leucopareia*), Snake River spring/summer and fall chinook salmon (*Oncorhynchus tshawytscha*), and the Steller sea lion (*Eumetopias jubata*); and several Species of Concern: one frog species, four plant species, and six bird species. It also includes three bird species and 10 plant species on the Forest Service Region 10 sensitive species list, but not listed as endangered, threatened or species of concern under the Endangered Species Act.

I. IDENTIFICATION OF ENDANGERED AND THREATENED SPECIES AND/OR CRITICAL HABITATS FOR SUCH SPECIES WITHIN THE PROJECT AREA.

A. Federal Threatened and Endangered Species and Species of Concern

Federally listed threatened and endangered species are those plants and animal species formally listed by the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS), under the authority of the Endangered Species Act of 1973, as amended. An endangered species is defined as one which is in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as one which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Species of Concern (formally category 2 candidate species) are those species for which there is information indicating the species might qualify for endangered or threatened status, but for which further evaluation is needed. A candidate species (formally category 1 candidate species) is one for which the agency has sufficient data in its possession to supporting listing the species as threatened or endangered.

Species listed as endangered or threatened are provided statutory protection under the Endangered Species Act of 1973, as amended; species of concern are not. Therefore, under the Endangered Species Act, agencies technically have no legal obligation to take action on species of concern. Although the USFWS and NMFS do not have legal authority to regulate management of National Forest lands for species of concern, the Forest Service has agreed to coordinate closely with the USFWS and NMFS in an effort to prevent these species from declining to where they need to be listed as threatened or endangered (Memorandum of Understanding January 25, 1994).

The State of Alaska has an Endangered Species Law which authorizes the Commissioner of the Alaska Department of Fish and Game (ADF&G) to list Alaska endangered species and species of concern.

Table 1 summarizes the threatened, endangered, and candidate species of animals and plants occurring on or near the Upper Carroll Project Area which are addressed in this Biological Assessment and Biological Evaluation.

Table 1
Status* of Threatened, Endangered, and Candidate Species Occurring On or Near the Upper Carroll Project Area with Summary BA/BE Finding.

SPECIES		STA-TUS		BA/BE FINDING
	USF-WS	FS	STATE	
Animals				
Humpback whale	E		E	Not Likely to Adversely Affect
Steller sea Lion	T			Not Likely to Adversely Affect
Alexander Archipelago wolf	C			May Affect Individuals; Not Likely to Adversely Affect Population Viability
American Peregrine falcon	E		E	Not Likely to Adversely Affect
Arctic Peregrine falcon	C		E	Not Likely to Adversely Affect
Peale's Peregrine Falcon		S		Not Likely to Adversely Affect
Aleutian Canada goose	T		E	No Effect
Trumpeter swan		S		Not Likely to Adversely Affect
Eskimo curlew	E		E	No Effect
Marbled Murrelet	C		C	May Affect Individuals, No Effect on Population Viability
Kittliz"s murrelet	C			No Effect
Osprey		S		No Effect
Queen Charlotte Goshawk	C	S	C	May Adversely Affect
Harlequin Duck	C			May Affect Individuals; No Effect on Population Viability
Olive-sided flycatcher	C			No Adverse Effect
Spotted Frog	C			Not Likely to Adversely Affect
Fish				
Snake River sockeye salmon	E			No Effect
Snake River spring/summer Chinook salmon	T			No Effect
Snake River fall chinook salmon	T			No Effect
Bull Trout	C			No Effect

APPENDIX D

SPECIES		STA-TUS		BA/BE FINDING
Plants				
Aster yukonensis	C			No Effect
Carex lenticularis var. dolia	C	S		Not Likely to Adversely Affect
Cirsium edule		S		No Effect
Glyceria leptostachya		S		May Affect Individuals; Not Likely to Adversely Affect Population Viability
Hymenophyllum wrightii		S		May Affect Individuals; Not Likely to Adversely Affect Population Viability
Isoetes truncata		S		No Effect
Ligusticum calderi		S		No Effect
Platanthera chorisianna		S		May Affect Individuals; Not Likely to Adversely Affect Population Viability
Platanthera gracilis		S		Not Likely to Adversely Affect
Poa laxiflora		S		May Adversely Affect
Rannunculus orthorhynchus var. alaschensis		S		Not Likely to Adversely Affect
Senecio moresbiensis		S		Not Likely to Adversely Affect
* E = Endangered, Federal or State; T = Threatened, Federal; C = Species of Concern, Federal or State; S = Sensitive, FS Region 10.				

There has been no critical habitat officially designated for any of these species at this time in Southeast Alaska, except for specific rookery (Mating and pupping) and haulout locations for Steller sea lions (CFR part 226, August 27, 1993).

The USFWS has identified northern goshawk and marbled murrelet as being species of concern within Revillagigedo Island Area (Holmberg March 5, 1992). In a more recent letter, the USFWS identified the Queen Charlotte goshawk and the Alexander Archipelago wolf as Species of Concern which should be addressed in the EIS as well as the following Species of Concern which also occur in Southeast Alaska: marbled murrelet (*Brachyramphus marmoratus*), harlequin duck (*Histrionicus histrioncus*), olive-sided flycatcher (*Contopus borealis*), and spotted frog (*Rana pretiosa*) (J.Lindell, USFWS, April 9, 1996).

The endangered American peregrine falcon may migrate through the Revillagigedo Island area, as may the Eskimo curlew, Aleutian Canada goose, and Harlequin duck and the Steller sea lion occurs in the adjacent saltwaters (Holmberg March 5, 1992). There has been no evidence of the existence of any other listed species within the Project Area.

The humpback whale (*Megaptera novaeangliae*) and Steller sea lion (*Eumetopias jubata*) were listed by the National Marine Fisheries Service (NMFS) in an assessment of the Project Area (Pennoyer February 6, 1992). During 1991, NMFS completed final recovery plans for the humpback whales. The Steller (northern) sea lion is currently listed as threatened (*Federal Register* Dec. 4, 1990; NMFS 1992).

No threatened or endangered plant species are known to occur in the Project Area. Two Forest Service listed sensitive species have been found within the project boundary--Davy Mannagrass (*Glyceria leptostachya*) and Choris bog orchid (*Platanthera Chorisiana*). Plant Species of Concern *Carex lenticularis* could potentially occur within the Project Area, but have not been documented or found.

II. THREATENED/ENDANGERED SPECIES ASSESSMENTS

HUMPBACK WHALE (*Megaptera novaeangliae*)

Distribution and Population

Humpback whales are the most abundant of the eight species of endangered whales that occur in Southeast Alaska waters. Their population in the North Pacific is about 1,200, which is about eight percent of the prewhaling population. These whales are regularly sighted in the Inside Passage and coastal waters of the Southeast Alaska panhandle from Yakutat Bay south to Queen Charlotte Sound. Humpback whales feed in Southeast Alaskan panhandle waters from about May through December, although some have been seen every month of the year. Peak numbers of whales are usually found in nearshore waters during late August and September, but substantial numbers usually remain until early winter. Baker et al. (1985) estimate that 300-350 humpback whales inhabit Southeast Alaska during the summer and fall.

The local distribution of humpbacks in Southeast Alaska appears to be correlated with the density and seasonal availability of prey, particularly herring (*Clupea harengus*) and euphausiids. Important feeding areas include Glacier Bay and adjacent portions of Icy Straight, Stephens Passage/Frederick Sound, Seymour Canal and Sitka Sound. Glacier Bay and Icy Straight appear to be an important feeding area early in the season, when whales prey heavily on herring and other small, schooling fishes. Frederick Sound is important

later in summer, when whales feed on swarming euphausiids. During autumn and early winter, humpbacks move out of the Sound to areas where herring are abundant, particularly Seymour Canal. Other areas of Southeast Alaska may also be important for humpbacks and need to be evaluated. These include: Cape Fairweather, Lynn Canal, Sumner Strait, Dixon Entrance, the west coast of Prince of Wales Island, and offshore banks such as the Fairweather Grounds.

Because the humpback inhabits shallow coastal areas, it is increasingly exposed to human activity. Consequently, these whales may be more susceptible to confrontational disturbance, displacement, and loss of habitat from environmental degradation than some other whale species. Humpbacks summering in Southeast Alaska have been linked to each of three wintering areas in Mexico, Hawaii, and Japan.

Effects of Upper Carroll Proposed Actions on Population or Habitat

The recovery plans for the humpback whale identified six known or potential categories of human impacts to these species: hunting, entrapment and entanglement in fishing gear, collisions with ships, acoustic disturbance, habitat degradation, and competition for resources with humans.

National Forest management activities which may have an effect on whale habitats or populations generally fall into the categories of acoustic disturbance and habitat degradation. These management activities include: the development and use of log transfer facilities (LTF's) and their associated camps, the movement of log rafts from log transfer facilities to mills, and the potential development of other docks and associated facilities for mining, recreation, and other forest uses and activities. Generally, with the development and use of LTF's and other docking facilities for projects, there is an associated increase in recreational boating in the immediate vicinity during the construction and use of the facilities.

Most of the information and data for whales in Southeast Alaska are associated with one species, the humpback whale, because it is the most abundant whale to occur in Southeast Alaska waters. The other seven species of whales are either present only seasonally as they migrate along the outer coastal areas, or are only occasionally found in the inside coastal waters of Southeast Alaska. The following discussion and analysis is primarily based on humpback whales, but is assumed to be applicable to the other species of whales.

Construction and operation of LTF's and other docking facilities are restricted to small, very localized areas of the marine environment. There are four LTF's currently on the Project Area (Fire Cove, Shrimp Bay, Shelter Cove and Carroll Inlet-See attached map). An estimated 2 acres of marine benthic disturbance associated with these existing LTF's could occur as a result of bark deposition. The Fire Cove, Shrimp Bay and Shelter Cove LTF's were designed to maximize flushing suspended bark away from the LTF area to the open sea before it can accumulate on the bottom, however, the Carroll Inlet LTF is an old site and poorly situated for flushing. A new LTF is proposed for construction under the Upper Carroll EIS to relocate the Carroll Inlet LTF further south to improve flushing-See attached map). Less than one acre of marine benthic habitat would be impacted by the construction of the new LTF.

There is little potential to directly affect whales with these facilities. During the summer of 1989, there was a report of a humpback whale entangled in some cables from an inactive LTF site on the Stikine Area. This is the only known direct effect incident related to LTF's.

Two potential indirect effects of LTF's and other docking facilities and associated activities have been identified: 1) effects on whale prey species, and 2) disturbances of whales by boat traffic associated with LTF's.

Effects on Prey. Nemoto (1970) noted that euphausiids and gregarious fish are the primary prey of humpbacks. Thirteen species of fish and 57 species of invertebrates were identified as humpback whale prey in Southeast Alaska. Humpbacks studied in Glacier Bay and Stephens Passage-Frederick Sound were found most frequently in areas of high prey density (Wing and Krieger 1983).

Construction and operation of all LTF's and similar facilities require U.S. Army Corps of Engineer and U.S. Environmental Protection Agency permits, and State of Alaska tidelands permits. The permitting process provides that construction and operation maintain water quality in the specific facility locations, and that marine circulation and flushing are maintained. All facilities must be in conformance with permit standards. Although the effects may vary locally, the major effect of leachates (ie. terpene, alpha-conindentric acid, alpha-conindentrin, hydroxymatairesinol, linoletic acid, and dehydroabientic acid) from stored log rafts, is upon invertebrates. Crustaceans, shrimp, and crab larvae, seem especially sensitive (Pease 1973, Buchanan and Tate 1976). EPA measuring techniques may be required to monitor the LC_{50} levels at each LTF (Peltier and Weber 1985) in order to insure impacts are limited to the approved "zone of deposit". A local increase in the herring and herring egg fishery could also impact this food item.

Effects from Disturbance. Humpback whale response to nearby boating activity varies from no apparent response to pod dispersal, sounding, breaching, evasive underwater maneuvers, and maintaining distance (Baker and Herman 1983, Baker et. al. 1982). Disturbance by boat activity has been suggested as one of the possible causes of observed changes in whale distribution in Southeast Alaska. Direct pursuit of whales by boats, and frequent changes in boat speed and direction appear to elicit avoidance behaviors more frequently than other types of boat traffic. However, whales may readily habituate to constant and familiar noise (Norris and Reeves 1978). Whales can be commonly found in some areas of Southeast Alaska which have considerable boat traffic. Whether they are habituated to boat traffic has not yet been documented. Adverse effects from current levels of boat traffic have not yet been documented.

Two basic types of boat activity associated with LTF's are log raft towing and recreational boating by workers. Log raft towing frequency would vary between camps, seasons, and years, with an average of about once a week during the working season (U.S.D.A. Forest Service 1989). Tug boats maintain relatively constant speeds and directions during log raft towing; constant speed and direction elicit less avoidance behavior from whales than other types of boating activity. Log raft towing routes are generally well established, and adverse effects from log raft towing have not been documented.

Recreational boating activity by camp residents would vary between seasons, years, and camps of different sizes. This activity would be concentrated near LTF sites, other docking facilities, and camps. It is estimated that most recreational boating would occur within a few miles of the site, few trips would be made over 10 miles, and activity greater than 30 miles from a site would be negligible. This boating would involve frequent changes in speed and direction and may include some small amount of whale pursuit, if the whales are within sight of the camp or an occupied boat. The effect of such recreational activity on whales would depend on many factors such as size of the bay, depth of the waters in the bay, number of boats, individual behavior responses of the whales, etc. At the present time, there is not a quantifiable way to estimate these possible effects.

The following Forest-wide standards and guidelines have been developed for the Tongass Land Management Pland Revision (1996) and are incorporated into the Upper Carroll FEIS by reference:

1. Provide for the protection and maintenance of whale habitats:

2. Ensure that Forest Service permitted or approved activities are conducted in a manner consistent with the *Marine Mammal Protection Act*, the *Endangered Species Act*, and National Marine Fisheries Service regulations for approaching whales, dolphins, and porpoise. "Taking" of whales is prohibited; "taking" includes harrassing or pursuing or attempting any such activity.

No adverse effects on whales from implementation of Forest management activities are anticipated. Indirect effects may be associated with possible increased boating activity, but compliance with Forest Service and NMFS standards and guidelines should partially mitigate any adverse effects on whales resulting from the proposed timber sale alternatives. The Forest Service has no control over the routes taken by tugboats with log rafts, nor does the Forest Service control recreational boating activities.

Summary Analysis: Not Likely to Adversely Affect.

STELLER SEA LION (*Eumetopias jubata*)

Distribution and Population

The Steller (northern) sea lion ranges from Hokkaido, Japan, through the Kuril Islands and Okhotsk Sea, Aleutian Islands and central Bering Sea, Gulf of Alaska, Southeast Alaska, and south to central California. There is not sufficient information to consider animals in different geographic regions as separate populations. The centers of abundance and distribution are the Gulf of Alaska and Aleutian Islands, respectively.

In 1990, because of an abrupt population decline observed over the last 31 years (primarily in the former Soviet Union, Gulf of Alaska, and Aleutian Islands), the NMFS listed the Steller sea lion as a threatened species throughout its range. The number of sea lions observed on certain rookeries from Kenai Peninsula to Kiska Island declined by 63 percent since 1985 and by 82 percent since 1960. Significant declines have also occurred on the Kuril Islands. Information on population trends in Southeast Alaska is sketchy, but what data does exist suggests that Southeast populations are stable or perhaps slightly decreasing.

The cause of overall population declines has not been confirmed. However, incidental mortality of sea lions in commercial fishing gear, shooting by fishermen, and reduced prey species due to commercial fishing operations, have probably contributed significantly to declines (Reeves et al. 1992).

When the sea lion was given emergency listing as a threatened species in the *Federal Register* (April 5, 1990), buffer zones restricting human activities were established around rookeries west of 150 degrees west longitude (does not include Southeast Alaska). The closest Steller sea lion rookery to the North Revilla Project Area is on Forrester Island, west of Prince of Wales Island. A sea lion haulout used for sunning and resting occurs on Grindall Island, of the south tip of Kasaan Peninsula. It is not designated as critical habitat. A recovery team has prepared a draft recovery plan.

Important food resources include walleye pollock, salmon, eulachon, and cephalopod mollusks. Steller sea lions forage predominantly in nearshore areas and over the continental shelf.

Effects of Upper Carroll Proposed Actions on Population or Habitat

The NMFS provides a summary of factors affecting the Steller sea lion (*Federal Register* April 5, 1991). These factors include reductions in the availability of food resources, especially pollock, which is the most important prey species for sea lions; commercial harvests of sea lion pups; harvests for subsistence and for public display and scientific research purposes; predation by sharks, killer whales, and brown bear; disease; the inadequacy of existing regulations regarding quotas on the incidental harvesting of sea lions during commercial fishing operations; other natural or human incidences such as shooting adult sea lions at rookeries, haulout sites, and in the water near boats. None of these factors are regulated by or within the jurisdiction of the Forest Service.

Southeast Alaska populations of Steller sea lions have not declined to the extent that other populations have. Harassment or displacement of sea lions from preferred habitats by human activities such as boating, recreation, aircraft, log transfer facilities, log raft towing, etc., is a concern with regard to long-term conservation of the sea lion in Southeast Alaska. Forest-wide standards and guidelines direct the Forest Service to prevent and/or reduce potential harassment of sea lions and other marine mammals due to activities carried out by or under the jurisdiction of the Forest Service, and these will be incorporated by reference into the Upper Carroll FEIS from the Draft Tongass Land Management Revision (1996). These Forest-wide standards and guidelines are as follows:

1. Protect Steller sea lion habitats.

2. Ensure that Forest Service permitted or approved activities are conducted in a manner consistent with the requirements, consultations, or advice received from the appropriate regulatory agencies for the Marine Mammal Protection Act, the Endangered Species Act, and National Marine Fisheries Service guidelines for approaching seals and sea lions. "Taking" of marine mammals is prohibited; taking includes harassment, pursuit, or attempting any such activity.

3. Locate facilities, camps, LTFs, campgrounds, and other developments 1 mile from known haulouts, and, farther away, if the development is large.

4. Cooperate with State and other Federal agencies to develop sites and opportunities for the safe viewing and observation of marine mammals by the public. Maintain a public education program explaining Forest management activities related to marine mammals in cooperation with State and other Federal agencies.

No direct effects on sea lions from Forest management activities are anticipated. Indirect effects may be associated with possible increased boating activity, but compliance with these standards and guidelines should mitigate any adverse effects on sea lion populations or their habitats for any of the alternatives

Summary Analysis: Not Likely to Adversely Affect

AMERICAN PEREGRINE FALCON (*Falco peregrinus anatum*)

Distribution and Population

The American peregrine falcon is primarily associated with interior Alaska for breeding, nesting and rearing of young. The falcon is highly migratory, wintering as far south as northern Argentina and occurring in Southeast Alaska only during migration periods (Ambrose, et al., 1988). Reproduction has increased population numbers three-fold in Alaska (ADF&G letter Feb. 6, 1987, Ambrose, et al., 1988, minutes of Interagency Wildlife Technical Committee Meeting of March 29, 1991). Population numbers of the American peregrine falcon are continuing to increase (ADF&G letter dated February 6, 1987; Ambrose et al. 1988).

Effects of Upper Carroll Proposed Action on Population or Habitat

The American peregrine falcon occur in Southeast Alaska only during migration. The primary reason for past declines in peregrine falcon populations was the proliferation of organochlorine pesticides, especially DDT and its principal metabolite DDE (Ratcliff 1969; Peskall 1976; Cade et al. 1971; Peskall and Kiff 1979; USFWS 1982). No organochlorine pesticides are authorized for use on the Tongass National Forest.

During migration through Southeast Alaska, the availability and abundance of prey species will most likely be the primary habitat factor affecting peregrine falcons. In coastal areas of Washington, the primary prey species for peregrine falcons were shorebirds and waterfowl species; passerine birds were also identified in the diet (Anderson and Debruyn 1979; Anderson et al. 1980). It is assumed that food sources would be similar for coastal Alaska. Peregrines forage over open sites such as over bodies of water, marshes, grasslands, and shorelines, as well as above wooded areas. Peregrines attack flying prey from above or by chasing them. Although they forage over wide areas, they also have preferred foraging sites (White 1974).

Actual migration routes and patterns, and foraging areas, have not been identified for the subspecies of peregrines in Southeast Alaska. Forest-wide standards and guidelines have been developed for protecting seabird rookeries and waterfowl concentration areas (USDA Forest Service, Draft TLMP Revision, 1996). A wide variety of passerine (perching and song) birds will be available from numerous open and forested communities under all alternatives associated with the Upper Carroll Project.

No adverse effect on American peregrine falcon populations or their habitats is anticipated with any Forest management activities under any of the alternatives.

Summary Analysis: Not Likely To Adversely Affect

The Peale's Subspecies of the peregrine falcon (*F. p. pealei*) nests on the outer islands west of Prince of Wales Island. This species is not listed as endangered or threatened, but is covered by a provision of the "similarity of appearance" which broadens the scope of the protection for all peregrine falcons. The nest distribution of this subspecies is closely associated with large seabird colonies, and seabirds are believed to be the major prey of the falcon. The Upper Carroll project is not near any of the known nest sites of Peale's peregrine falcon and no effect is anticipated.

Summary Analysis: Not Likely to Adversely Affect

ALEUTIAN CANADA GOOSE (*Branta canadensis leucopareia*)

Distribution and Population

The breeding, nesting, and rearing of young Aleutian Canada geese is primarily associated with the Aleutian Islands. The Aleutian Canada goose winters in western Oregon, and in northwestern and central California. Although their movements within Alaska are not well known, the Aleutian Canada goose may occur in Southeast Alaska during migration. Population numbers in Alaska are increasing, and the USFWS is considering removing the species from the threatened list.

Effects of Upper Carroll Proposed Action on Population or Habitat

The Aleutian Canada goose is not primarily associated with Southeast Alaska. Although migration patterns in Alaska are not well known, Aleutian Canada geese may occur in Southeast Alaska as migrants. Due to the limited use of the Project Area by Aleutian Canada geese, no adverse effect on their population by any of the alternatives is anticipated.

Summary Analysis: No Effect

ESKIMO CURLEW (*Numenius borealis*)

Distribution and Population

The Eskimo curlew is primarily associated with western and northern Alaska. The Eskimo curlew is rare and not typically found in Southeast Alaska, but it may occur as a migrant.

Effects of Upper Carroll Proposed Action on Population or Habitat

Due to the limited use of the Project Area by the Eskimo curlew, no adverse effect on their population by any of the alternatives is anticipated.

Summary Analysis: No Effect

SNAKE RIVER SOCKEYE SALMON (*Oncorhynchus nerka*)

Distribution and Population

Sockeye salmon are found along the North American coastline from the Klamath River in California to the Yukon in Alaska. The only remaining population of Snake River sockeye salmon spawns in Redfish Lake, Idaho, located at the head of the middle fork of the Salmon River.

Adult sockeye spawn on the beach areas of Redfish Lake in October and Novemeber. Most of the sockeye in Redfish Lake remain in the lake for one or two years, migrate to sea, and remain in the ocean for to to three years before returing to spawn. Adult returns to Redfish Lake were 1, 0, 4, 1, 8, and 1 in 1989, 1990, 1991, 1992, 1993, and 1994, respectively. (NMFS, 1996)

Effects of Upper Carroll Proposed Action on Population or Habitat

According to the NMFS (letter to USFS, May 10, 1996), the presence of Pacific Northwest salmon is not documented for these waters, but their occurence is possible. Standards and guidelines contained in the Draft TLMP Revision (1996) and requirements of the Tongass Timber Reform Act are incorporated into the project to protect anadromous fish habitat. No significant impact is expected because none are found in any freshwater river system in the Project Area. Impacts to saltwater fisheries are mainly associated with Log Transfer Facilities and log storage and towing. There is a limited potential for effects to occur while fish are in the saltwater life stages in the area. Due to the infrequent occurence of Snake River sockeye salmon in the Project Area, no adverse effect on their population by any of the alternatives is anticipated.

Summary Analysis: No Effect

SNAKE RIVER SPRING/SUMMER AND FALL CHINOOK SALMON (*Oncorhynchus tshawytscha*)

Distribution and Population

Snake River spring/summer chinook spawn in streams associated with the Clearwater, Grande Ronde, and Salmon Rivers as well as the mainstem of the Tucannon and Imnaha Rivers and Asotin, Granite, and Sheep Creeks. Populations have declined severely since the late 1800's. The lowest return on record (357) of jack spring and summer chinook salmon to Lower Granite Dam was in 1990. Adult and redd counts are expected to decline considerably over the next two years. (NMFS 1996)

The Snake River fall chinook salmon spawns in the mainstream Snake River from the upper end of the Lower Granite Dam Reservoir to Hells Canyon Dam and the lower reaches of the Imnaha, Grande Ronde, Clearwater, and Tucannon Rivers. Adult returns of fall chinook salmon to the Snake River have declined in recent years. Escapement to Lower Granite Dam was estimated at 78 in 1990, 318 in 1991, and 855 in 1992.

Effects of Upper Carroll Proposed Action on Population or Habitat

According to the NMFS (letter to USFS, May 10, 1996), the presence of Pacific Northwest salmon is not documented for these waters, but their occurence is possible. Standards and guidelines contained in the Draft TLMP Revision (1996) and requirements of the Tongass Timber Reform Act are incorporated into the project to protect anadromous fish habitat. No impact is expected because none are found in any freshwater river system in the Project Area. Impacts to saltwater fisheries are mainly associated with Log Transfer Facilities and log storage and towing. There is a limited potential for effects to occur while fish are in the saltwater life stages in the area. Due to the infrequent occurence of Snake River spring/summer and fall chinook salmon in the Project Area, no adverse effect on their population by any of the alternatives is anticipated.

Summary Analysis: No Effect

III. SPECIES OF CONCERN ASSESSMENTS

ALEXANDER ARCHIPELAGO WOLF (*Canis lupus ligoni*)

Taxonomic Status and Range

The Alexander Archipelago wolf is a small subspecies of the gray wolf (Goldman 1937, Pedersen 1983), similar in appearance to the Vancouver Island wolf (*C.l. crassodon*). Kirchhoff (1992) described the Alexander Archipelago wolf as occurring on the Southeast Alaska mainland and all large island in Southeast Alaska except for Admiralty, Baranof, and Chichagof.

On December 17, 1993, the USFWS received a petition from the Biodiversity Legal Foundation to list the Alexander Archipelago wolf of Southeast Alaska as threatened pursuant to the Endangered Species Act. On May 13, 1994, the USFWS found that the petitioners had presented substantial information indicating that listing may be warranted and a status review of the species was initiated. On February 16, 1995, the USFWS found that there was not enough scientific evidence to warrant listing.

The primary food of most Southeast Alaskan wolves is deer (Wood 1990, Person 1993). Beaver, mountain goat, and moose are also primary prey in some mainland areas and spawning salmon are fed on when available (Wood 1990). Alexander Archipelago wolf abundance is likely linked to deer abundance and availability, particularly in southern island habitats (Suring et al. 1988, Wood 1990, Person 1993).

Based on field observations, discussions with trappers and anecdotal information, the wolf population in Southeast Alaska was estimated to be 635 to 690 individuals, distributed in 85 packs (Morgan 1990). However, Person (per. comm. 1994, as cited in USFWS letter) estimates that the current Southeast population is 1,000 individuals and that 30-40 percent of them occupy Prince of Wales Island.

Many studies have shown that wolf abundance may be correlated with road density (Theil 1985, Jensen et al. 1986, Mech et al. 1988, Fuller 1989). In one study, wolves generally were not present where the density of roads used by humans exceeded 0.93 mi/sq mi (0.58 km/sq km) (Mech et al. 1988). However, other work has suggested that wolves could exist in areas with higher densities if these areas were adjacent to roadless areas (Mech et al. 1988). The primary threat of high road densities is the increased access to humans who kill wolves by shooting, snaring, or trapping (Van Ballenberghe et al. 1975, Mech 1977).

Based on application of the Tongass Habitat Capability Model for the gray wolf (see Upper Carroll DEIS), habitat capability declined by about 40% in the Project Area between pre-logging and existing conditions. This decline is directly related to a reduction in deer habitat capability associated with conversion of old-growth forest to young second growth. Accompanying this decline has been an increase in road density associated with logging activities. Total road density under existing conditions is approximately 0.20 mi/sq mi and the open road density is approximately 0.01 miles per square mile across the Project Area. None of the roads are connected to the Ketchikan Road System.

Effects of Upper Carroll Proposed Action on Population or Habitat

Implementation of any of the Upper Carroll Project action alternatives will result in a reduction in deer habitat capability. Wolf habitat capability is predicted to be reduced in proportion to the reduction in deer habitat capability. The wolf habitat capability reduction is predicted to range from 1.8 percent for Alternative 7 to 7.3 percent for Alternative 2, and 3.6 percent, 5.5 percent, and 3.6 percent for Alternatives 3, 5, and 6, respectively.

A conservation assessment was completed for the wolf during the analysis for the Tongass land Management Plan Revision Draft. This assessment was completed by an interagency team of biologists. The assessment team recommended considering a reserve system that precludes roads (or road use) in areas the size of typical core home ranges (mean size = 38 square miles). Misty Fjords National Monument covers the east half of Revillagigedo Island and is adjacent to the Upper Carroll Project. The Naha Block (62 square miles) is adjacent to the Upper Carroll Project to the west. The Orchard block (23 square miles) is adjacent to this project to the north. Alternatives 3 and 7 in the Final EIS also leave the west fork of Carroll Creek as a small reserve area, which enlarges the Naha block. These measures serve to mitigate some of the effects of harvesting and road building in the project area. The assessment team also recommended that road densities in these areas should be well below 0.4 miles/square mile.

Road densities will also increase in the Project Area as a result of implementation of one of the action alternatives. Total road density would range from 0.20 mi/sq mi for Alternatives 1 to 1.16 mi/sq mi for Alternative 2 after implementation. Alternatives 3, 5, 6, and 7 would result in a total road density of 0.56, 0.88, 0.53, and 0.26 miles/sq. mi, respectively. However, the effect of increased road density would be substantially mitigated by access management and the fact that the road system in the Project Area is not connected to a population center (such as Ketchikan or like the situation on Prince of Wales Island).

Only the main road along Carroll Creek would remain open after project completion. All other roads will be closed by bridge or culvert removal, organic encroachment, or other closure methods. This would result in an open road density of 0.01, 0.45, 0.11, 0.25, 0.14, and 0.05 miles per square mile for Alternatives 1, 2, 3, 5, 6, and 7 respectively.

All Alternatives except Alternative 2 will result in less than 0.4 miles of open road per square mile in the Upper Carroll Project area. The open road density for the project area will be below the critical threshold of 0.93 miles per square mile (Mech et al. 1988) for all alternatives.

Because of the reduction in deer habitat capability and the increase in road density associated with implementation of one of the action alternatives, the Upper Carroll Project may affect the Alexander Archipelago wolf. However, the effects of this project are not expected to be substantial due to the amount of roadless areas surrounding the Project Area and the fact that the road system is isolated from human population centers.

Summary Analysis: May Affect Individuals; Not Likely to Adversely Affect Population Viability

ARCTIC PEREGRINE FALCON (*Falco peregrinus tundris*)

Distribution and Population

The Arctic peregrine falcon is primarily associated with the area north of the Brooks Range and Seward Peninsula; it is highly migratory, wintering as far south as northern Argentina (Ambrose et al. 1988). It occurs in Southeast Alaska only during mirgation periods. Population numbers have increased three-fold in Alaska (ADF&G letter Feb. 1987; Ambrose et al. 1988; minutes of Interagency Wildlife Technical Committee Meeting of March 20, 1991). Effective November 4, 1994, the USFWS removed the species from the threatened list. It now has the status of a Species of Concern.

Effects of Upper Carroll Proposed Action on Population or Habitat

As described for the American peregrine falcon, no effect on the population or habitat of the Arctic peregrine falcon is anticipated due to any Upper Carroll action alternative.

Summary Analysis: Not Likely to Adversely Affect

MARBLED MURRELET (*Brachyramphus marmoratum*)

The marbled murrelet is a small seabird that belongs to the family Alcidae. It is found throughout the North Pacific, the Asia subspecies (*B. m. perdix*) ranges from the Sea of Okhotsk, Kamchatka and Commander Islands, south to Korea, Japan and Kurile Islands. The North American subspecies (*B. m. marmoratus*) ranges from the Aleutian Archipelago in Alaska, eastward to Cook Inlet, Kodiak Island, Kenai Peninsula, and Prince William Sound, southward coastally throughout the Alexander Archipelago of Alaska and through British Columbia, Washington, Oregon to central California, with individuals wintering as far south as southern California (Marshall 1988, USFWS 1992). The species feeds below the water's surface on small fish and invertebrates in near-shore marine waters (Marshall 1988, USFWS 1992).

Marbled murrelets nest on land or in trees and lay only one egg. They are semi-colonial in their nesting habitats; nesting marbled murrelets are often aggregated (USFWS 1992). Alaska is the only state where marbled murrelets are known to nest on the ground in treeless areas. At least 18 ground nests have been identified with certainty as of 1994, based on sightings of the incubating bird (Mendenhall 1992, pers. comm., K. Nelson, Oregon Coop. Wildl. Res. Unit, Corvallis 1995 as cited in Polk Inlet BA/BE). Through 1994, a minimum of 73 tree nests have been located in North America (26 in Oregon, 6 in Washington, 11 in California, 11 in British Columbia and 19 in Alaska). Of 47 nests found in Washington, Oregon and California where data were available, all were located in old-growth trees that ranged in diameter at breast height from 35 inches

to 210 inches. Nest trees located in Alaska ranged from 12 to 41 inches DBH (pers. comm., K.Nelson as cited in Polk Inlet BA/BE). Nests were located high above the ground and usually had good overhead protection (USFWS 1992). Both males and females incubate marbled murrelet eggs; one bird stays at the nest for 24 hours, while the other is feeding on the ocean. After hatching their young, the adults stay at the nest with the young bird for only about four days. After that, the young bird is left alone in the nest, except when the adults return to the nest to feed it (Interagency Meeting Records June 12, 1989).

Except for the fall period when they are molting, flightless, and stay on the ocean, birds have been known to fly to tree stands every month of the year. In Washington, birds have been recorded up to 50 miles inland (Hamer and Cummins 1991, in USFWS 1992).

Overview of work in Alaska. There is a current upland study of marbled murrelets on Naked Island in Prince William Sound. In the study area, murrelets flew most frequently into two areas with steep slopes facing west, and 70-80% cover of hemlock old-growth. A cursory review of the small sample suggested greater murrelet use of inland areas at the heads of bays as opposed to the outer peninsulas. Slopes facing northeast, west or southwest may have greater use than slopes facing north, northeast or southeast on Naked Island (Kuletz 1991).

In 1984 during a marbled murrelet research project conducted by the ADF&G, a tree nest was found on Baranof Island. This nest was on a large horizontal limb, 82 feet up in a mountain hemlock tree. Thorne Bay Ranger District personnel collected data on a nesting stand on Prince of Wales Island in 1990. An occupied marbled murrelet ground nest was found in 1992 on Thorne Bay Ranger District (Ford and Brown 1995)

In 1994, marbled murrelet dawn surveys were conducted in Carroll Creek drainage July 7,8 and 9th at 3 widely separated locations with few detections. However, many marbled murrelets are often observed throughout Carroll Inlet. The low number of detections at the dawn count stations do not appear to be consistent with the high number of observations in Carroll Inlet. The high number of observations in Carroll Inlet suggest a higher amount of use in the Upper Carroll Project.

Ralph et al. (1995) estimated the marbled merrelet population in Southeast Alaska at 96,200. However, a much more thorough study (Agler et al. 1995) determined the early-summer, on-water population (+ or - 95% CI) in Southeast Alaska to be 434,129, + or - 166,525. Figure 36 of Agler et al. (1995) shows the density in Carroll Inlet at less than 10 birds per square kilometer, while the average for marbled and Kittlitz's murrelets together throughout Southeast Alaska was 19.4 birds per square kilometer (Table 6 of Agler et al. 1995)

Effects of Upper Carroll Proposed Action on Population or Habitat

No nesting sites for marbled murrelets have been identified within the Project Area, although it is assumed that they nest in suitable habitats.

Since all inland forest stands on the Tongass National Forest are less than 25 miles from salt water, all could be potential marbled murrelet nesting habitat (USDI Fish and Wildlife Service 1992). However, these birds more commonly occupy larger stands (greater than 500 acres) than smaller stands (less than 100 acres) in California; marbled murrelets are usually absent from stands less than 60 acres in size (Paton and Ralph 1988, Ralph et al. 1990). Without precise knowledge to delineate the differences, all old-growth habitat greater than 8 MBF/acre is assumed to be suitable for nesting.

All action alternatives will harvest stands which may be capable of providing nesting habitat (old-growth forests) for marbled murrelets. Table 2 shows that Alternative 2 harvests 10 percent, Alternative 3 harvests 5 percent, Alternatives 5 harvests 8 percent, Alternative 6 harvests 5 percent, and Alternative 7 harvests 3

percent of the old-growth habitat (VC 4-7) in the Project Area, leaving at least 12,013 acres of old-growth (VC 4-7) unharvested.

In areas with timber harvesting, the amount of nesting habitat for marbled murrelets will be reduced. Murrelets would not likely re-occupy a clearcut area until the regenerating forest attained a suitable degree of complexity and individual trees attained a suitable size, perhaps not sooner than 150 years (Assessment of the Marbled Murrelet for the TLMP Revision). The amount of old-growth currently being used by marbled murrelets is unknown. The factors currently limiting marbled murrelets in Southeast Alaska have not been identified. Due to the amount of unknowns associated with marbled murrelets, it is not known what the actual effects of timber harvest will be, other than the total amount of habitat is reduced. Fragmentation or increased edge effects may also reduce habitat capability for marbled murrelets.

Even if the breeding population were reduced in rough proportion to the percentage of productive old-growth forest harvested under the action alternatives (3-10%), the population in the Upper Carroll Assessment Area would still be strong. Morover, the effect on the huge Southeast Alaska population (434,000 + or - 166,000) would be negligable.

Table 2
Acres and Percent of Wildlife Habitats Proposed for Harvest, by Alternative

		Alt. 2		Alt. 3		Alt. 5		Alt. 6		Alt. 7	
Habitat	Existing Acres	Acres Cut	% Chg	Acres Cut	% Chg	Acres Cut	% Chg	Acres Cut	% Chg	Acres Cut	% Chg
Old Growth	17,641	1,778	10	941	5	1,453	8	912	5	504	3

SOURCE: Data derived from GIS data base.

Murrelet nests are exceedingly difficult to find, and no intensive nest searches in Upper Carroll units are planned. However, if any nests are discovered, they will be protected by 600 foot radius buffers as per standards and guidelines in the RSDEIS of the Tongass Land Management Plan (1996).

Summary Analysis: May Affect Individuals; but No Effect on Population Viability.

KITTLITZ'S MURRELET (*Brachyramphus brevirostris*)

No kittlitz's murrelet has been identified in the Upper Carroll Assessment Area. Still, the kittlitz's population for Southeast Alaska as a whole *is* strong: calculated at 253,000 from Agler et al. (1995). Therefore, the Upper Carroll Project is not expected to affect kittlitz's murrelets.

Summary Analysis: No Effect

QUEEN CHARLOTTE GOSHAWK (*Accipiter gentilis laingi*)

Distribution and Population

The American Ornithologists Union (AOU) recognizes two subspecies of the northern goshawk in North America, *Accipiter gentilis atricapillus* and *A.g. laingi*, the Queen Charlotte goshawk (AOU 1957). Taverner (1940) first described the darker plumaged Queen Charlotte goshawk as a distinct race occurring in the coastal temperate rainforests of the Queen Charlotte Islands and Vancouver Island, British Columbia. Web-

ster (1988) found that the Queen Charlotte goshawk occurred from Vancouver Island north to the Taku River near Juneau. The northern goshawk is identified as a Species of Concern throughout its range.

On May 9, 1994, the USFWS received a petition from the Southwest Center for Biological Diversity and numerous copetitioners, to list the Queen Charlotte goshawk as endangered pursuant to the Endangered Species Act. On August 19, 1994, the USFWS found that the information presented by the petitioners together with the information in USFWS files was substantial and indicated that listing may be warranted. Therefore, a status review of the species was initiated. After seeking public comments and reviewing all the available information on the goshawk, a finding was issued June 28, 1995, that protection under the Endangered Species Act is not warranted at this time for the Queen Charlotte goshawk.

The goshawk is a wide-ranging forest raptor that generally occurs in low densities, from 2.4 pairs (Central Alaska, McGowan 1975) to 11.0 pairs (Arizonia, Crocker-Bedford and Cheney 1988) per 100 square kilometers, although population densities in Southeast Alaska may be much lower (Crocker-Bedford 1992). The most recent estimates of the goshawk population in Southeast Alaska range from 100 to 381 pairs (USDA Forest Service 1991a; Crocker-Bedford 1994) to 100 to 800 pairs (Alaska Interagency Goshawk Committee, Report of June 30, 1994).

The primary concern for goshawk population viability has been due to loss of habitat due to timber harvest on the Tongass National Forest. Recent results of studies within the range of the Queen Charlotte goshawk(ADF&G 1993, Titus et al. 1994), indicated a greater frequency of relocations of radio-tagged goshawks in mature and old-growth forest. Of 18 nest trees for which habitat attributes were characterized, 16 were in old-growth and two were in second growth trees greater than 90 years of age. Of 661 radio relocations, over 90% were in habitat classified as volume class 4 or greater and 68% were in habitats classified as volume class 5 or greater (Titus et al. 1994).

Reynolds (1983) reported home ranges to be 2,000 to 3,200 hectares. These home ranges may include a mosaic of habitat types, with a strong preference for mature forest with flight space beneath the canopy (Reynolds 1989, USDA Forest Service 1990). Home range size is strongly dependent upon quality of the foraging habitat and prey availability (Kenward 1982). Titus et al. 1994 reported breeding period home ranges for 16 adult goshawks in Southeast Alaska as large as 19,613 hectares and year-round home ranges as large as 114,728. hectares.

A recent review of the Queen Charlotte goshawk summarized habitat use as follows (Crocker-Bedford 1994):

"Analyses of habitat use have shown similar results throughout the geographical range of the northern goshawk in the United States. Home ranges include stands of large trees for nesting, as well as for greater abundance of some prey. The higher canopy provided by large trees, along with sparser than normal shrubs and small trees, appears to facilitate goshawk flight and prey capture. Closed canopies appear to provide preferred microclimate in the nesting stand, increased productivity of some important prey species, and reduced competition and predation by open-forest raptors. A literature review indicated that goshawk densities tend to decrease with the amount of timber harvest, and that goshawks may sometimes be impacted by forest fragmentation. In Southeast Alaska 92 percent of the relocations on radio-tagged goshawks were in old-growth forests having over 8 mbf/ac. Old-growth having over 20 mbf/ac was most preferred."

Goshawks generally select forest stands with large trees on gentle slopes at lower elevations for nesting and foraging (Reynolds 1989, USDA Forest Service 1990). Foraging habitat is generally characterized by a greater diversity of age classes and structural characteristics (e.g., snags, woody debris) than nesting areas; foraging areas also comprise the largest percentage of goshawk home ranges (Reynolds et al. 1991). Goshawks feed primarily on ground-dwelling birds and small animals.

Goshawk sensitivity to timber harvest resulted in management recommendations to protect nest site integrity (USDA Forest Service 1990, USDA Forest Service 1991a, USDA Forest Service Alaska Region 1992 and

1994). Other management recommendations recognized the importance of the foraging area within the post-fledging area (Kennedy 1989, Crocker-Bedford 1990, USDA Forest Service 1991, and USDA Forest Service Alaska Region 1992 and 1994). There is now widespread recognition of the importance of most foraging habitat, including areas far from the nesting site (Reynolds 1989,USDA Forest Service 1990, Crocker-Bedford 1990, 1991, 1992, 1994a and 1995, Marshall 1992, Reynolds et al. 1991, USDA Forest Service Alaska Region 1994, Hayward et al. 1995).

Since 1992, more inventory effort has been spent to find goshawks than any other animal in Southeast Alaska. Twenty-one goshawk nest areas were documented in Southeast Alaska with activity between 1990 and 1993 (Titus et al. 1994). At least one nest site was located at 18 of these areas, including 8 active nests in 1993. In 1994, a total of 33 historic and current sites with at least one nest were documented; active nests were located at 21 of these sites (ADF&G 1994). Despite searches in new locales, and following radioed birds to 5 new sites in 1995, the number of known, occupied nest sites decreased from 21 to 10 between 1994 and 1995 (C. Flatten, pers. comm.)

Inventories were conducted in the Project Area during the summers of 1993, 1994 and 1995 by Ketchikan Ranger District personnel utilizing the Alaska Region Goshawk survey protocol. Goshawk calls were broadcast from more than 255 call stations. There was not any response to the calls and no confirmed sighting, although telemetry results from the goshawk pair in Traitors Creek reveal that those birds do forage in the Carroll Creek drainage. More than 74 biologist days were spent surveying the Project Area. Although the inventory techniques were among the best available, there is a high likelihood that nests were missed even in the stands that were sampled (Kimmel, J. T. and R. H. Yahner 1990; Kennedy and Stahlecker 1993).

On May 1, 1996, a pair of goshawks were observed in the project area. No nest was found, but vocalizations were heard that indicated a possible food transfer between a male and female goshawk. A "kakking" call was heard from one bird, followed by a "wail" call from a different bird, followed by a few minutes of silence. An adult goshawk was then seen flying from the stand of timber. This suggests the probability of a nest nearby.

The Draft TLMP Revision (1996) proposes protecting 100 acres around each known or probable goshawk nest. Woodbridge and Detrich (1994) determined that the chance of nest site reoccupancy increased as the amount of suitable habitat (e.g. mature forest) surrounding the nest increased to over 150 acres. All units laid out for the Final EIS will follow the management guidelines for goshawks in effect at the time of implementation.

Effects of Upper Carroll Proposed Action on Population or Habitat

The value of clearcut stands for goshawk nesting or foraging is very low. Landscapes with large portions of early seral forest reduce cumulative landscape habitat quality (Assessment of the Northern Goshawk for the TLMP Revision). Harvesting of the units in the Upper Carroll Project would increase the amount of early seral forest, thus reducing the cumulative landscape habitat quality.

Alternatives 2, 5, and 6 propose timber harvest near the probable nest site observed on May 1, 1996. The location of the nest is not known at this time. Field surveys will continue through project implementation. Goshawk guidelines in effect at the time of implementation would be followed to mitigate impacts to nesting goshawks.

Goshawks have been observed in the Carroll Creek drainage via telemetry tracking of radio-tagged goshawks from the Traitors Creek area. These birds foraged in the Project Area, so any alternative that harvests timber in the Carroll Creek drainage has the potential to affect goshawks. Alternatives 2,5, and 6 also harvest timber in the immediate vicinity of the goshawk radio relocations, and so would have the greatest potential to effect goshawks.

Any pairs of goshawks not discovered prior to timber harvest may be affected if the harvest units correspond to key stands of habitat. Any goshawk nest found prior to harvest will be protected utilizing the Regional goshawk management guidelines. Currently (RSDEIS of TLMP 1996) standards and guidelines would only protect 100 acres around a nest. Although the buffer may be adequate if only 3% of the old growth of a drainage is harvested an any one decade (Hayward et al. 1995), the nest site will likely not be occupied long after timber harvesting if large amounts of harvest occur in the surrounding watersheds (Crocker-bedford 1990, 1991, 1994, and 1995; Patla 1991, Reynold et al. 1991, Marshall 1992, Woodbridge and Detrich 1994, Harward et al. 1995).

Summary Analysis: May Adversely Affect

HARLEQUIN DUCK (*Histrionicus histrionicus*)

Distribution and Population

The harlequin duck's range is divided into two separate and distinct regions: eastern and western. The eastern range embraces Iceland, parts of Greenland, and Labrador, with the winter range extending as far south as New Jersey. The western range includes northeast Siberia west to the Lena River, east to the Kamchatka Peninsula and the Commander Islands and north to the Arctic Circle, then across the Bering Sea to the Aleutian Islands, much of interior Alaska, and south to northwest Wyoming and central California (Bellrose 1980). For Alaska, the harlequin duck has been reported as a fairly common year-round resident, and at one season or another, has been recorded over much of the State, except the Arctic coast (Gabrielson and Lincoln 1959). Agler (1995) determined the early summer, salt water population in Southeast Alaska to be 44,000 (+ or - 19,000). They saw none in Carroll Inlet.

Available evidence indicates that the species breeds locally over much of southern Alaska, probably the Aleutians, and north to Anaktuvuk Pass. All ornithologists who have worked during the spring and summer months in the Alexander Archipelago and other parts of Southeast Alaska, have commented upon the numbers of these ducks, frequently summarizing their observations by stating that they were common or abundant (Gabrielson and Lincoln 1959).

Harlequins nest along inland rivers and streams. The nest site is usually 6 feet (but up to 60 feet) from water (DeGraff et al. 1991). The site chosen usually has shelter overhead - a recess in a stream bank, or among rocks, or under shrubs, trees, or stranded debris. Occasionally the nest is in an open area, but under shrubbery of other low vegetation, or even on a stream bar. There is no proof that harlequins nest in tree cavities (Bellrose 1980; Armstong et al. 1983; Kortright 1962; Godfrey 1979; Palmer 1975). During the winter the harlequin duck is common to abundant in the coastal waters of Southeast Alaska, Prince William Sound, Cook Inlet, the bays of the Alaska Peninsula, the Aleutians and the Pribilofs (Gabrielson and Lincoln 1959). Preferred winter habitat is reported to be areas along surf-pounded rocky coasts -- not in sheltered bays and fjords, but instead where water is one to two fathoms deep and turbulent, and where bottom fauna abounds (Palmer 1975). Harlequins feed on molluscs, crustaceans, insects, fish, and echinoderms (Bellrose 1980).

Effects on Population or Habitat

Nesting habitat for the harlequin duck occurs along inland rivers and streams. Riparian habitats along all rivers and streams on the Forest will be managed according to the Riparian and Lake Standards and Guidelines in the Draft TLMP Revision (1996) or a more restrictive management prescription (such as when a stream or river is in a Wilderness Area). Nesting habitat requirements are expected to be maintained. Winter habitat occurs in the marine environment, in areas of high surf and rocky beaches. A small chance exists that the Upper Carroll Project could affect a few individual harlequin ducks. Still, it will not cause a trend towards listing.

Summary Analysis: May Affect Individuals, but No Effect on population viability.

OLIVE-SIDED FLYCATCHER (*Contopus borealis*)

Distribution and Population

The olived-sided flycatcher breeds in wooded regions from central Alaska east to Newfoundland and south to northern Baja California and central Arizonia in the west, central Minnesota and northern Michigan in the Central States, and North Carolina and Tennessee in the East. The species winters in South America.

It inhabits open coniferous forests and forest edges along lakes. streams, and muskegs (Bent 1942). Godfrey (1979) described the habitat of the species as "Burntlands with standing dead trees, bogs, lakeshores with water-killed trees, lumbered areas, and other clearings in woodland". DellaSala et al. (1994) noted that the species was often observed using habitats associated with lakes and muskegs during a breeding bird study on central Prince of Wales Island.

Effects of Upper Carroll Proposed Action on Population or Habitat

Riparian habitats along all lakes, rivers, and streams on the Forest will be managed according to the Riparian and Lake Standards and Guidelines in the Draft TLMP Revision (1996) or a more restrictive prescription. The Riparian and Lake Standards and Guidelines are found on pages 4-61 of the Proposed Revised Forest Plan in the TLMP Draft Revision (1996).

Since Olive-sided flycatchers are not an old growth dependant species, they are not expected to be negatively affected by logging in the Upper Carroll Project. Some units may create openings which produce greater edge, and if reserve trees and snags are retained, flycatcher habitat could actually be improved. Therefore, the Project may affect olive-sided flycatcher habitat, though the effect is likely to be positive.

Summary Analysis: No Adverse Effect.

SPOTTED FROG (*Rana pretiosa*)

Distribution and Population

The spotted frog occurs in or near fresh water and is believed to range south from the Taku river, other transboundary rivers and some islands of Southeast Alaska and British Columbria (Holmberg, April 17, 1992). Spotted frogs have been documented in the Stikine River basin (Waters 1992). Presence of spotted frogs on Revillagigedo Island has not been confirmed. Five sampling sites representing 9 water bodies were trapped or shoreline inspected for the presence of amphibians. All surveys were in the Carroll Creek drainage. No spotted frogs were found. Rough-skinned newts (*Taricha granulosa*) occurred commonly (greater than 10 individuals trapped or seen) in more than 50 percent of the sites. Western toads (*Bufo boreas*) were seen or trapped in only one pond, but have been observed in large numbers near at the Carroll River estuary.

Effects of Upper Carroll Proposed Action on Population or Habitat

Riparian habitats along all lakes, rivers, and streams on the Forest will be managed according to the Riparian and Lake Standards and Guidelines in the Draft TLMP Revision (1996) or a more restrictive prescription. The

Riparian and Lake Standards and Guidelines are found on pages 4-61 of the Proposed Revised Forest Plan in the TLMP Draft Revision (1996). With implementation of Riparian standards and guidelines, no effects on the spotted frog is anticipated by the Upper Carroll Project, even if they are found to occur within the Project Area.

Summary Analysis: Not likely to adversely affect.

BULL TROUT (*Salvelinus confluentus*)

Distribution and Population

Although the range of Bull trout in the contiguous United States has become greatly restricted in recent times (Goetz as cited in Has and McPhail 1991), it still exists as far south as the Oregon-California border, north through Canada and in the Yukon River system in Alaska (Haas and McPhail 1991). Bull trout are largely confined to interior regions throughout their distribution, only reaching the Pacific coast in the Puget Sound area of Washington and in the Fraser River drainage in British Columbia (Haas and McPhail 1991). Since bull trout have only been observed in the interior drainage of other major river systems, it is not likely that bull trout occur in the streams of the Upper Carroll Project Area.

Effects of Upper Carroll Proposed Action on Population or Habitat

Riparian habitats along all lakes, rivers, and streams on the Forest will be managed according to the Riparian and Lake Standards and Guidelines in the Draft TLMP Revision (1996) or a more restrictive prescription. The Riparian and Lake Standards and Guidelines are found on pages 4-61 of the Proposed Revised Forest Plan in the TLMP Draft Revision (1996). With implementation of Riparian standards and guidelines, no effects on the bull trout is anticipated by the Upper Carroll Project, even if they are found to occur within the Project Area. It is unlikely that they occur in the project area.

Summary Analysis: No effect.

PLANT SPECIES OF CONCERN

Field surveys were conducted for Sensitive Plants and plant Species of Concern. Survey methods involved a single-entry survey of probable habitats. Areas were identified by photos and existing field knowledge. Field surveys were conducted during the season most favorable for species identification, e.g. during the flowering season in July, 1995. A qualified botanist spent ten days surveying approximately 600 acres within the project area.

Aster yukonensis

This taxon is known from an area near Bettles, north of the Yukon River, and from the north side (continental side) of the St. Elias Range, north of Yakutat (Murray and Lipkin 1987). The plant would not be expected to occur in the Project Area (DeMeo 1992).

Searches of the Project Area for candidate and sensitive plants were made by interdisciplinary-trained teams and trained botanists. No observations of this species were made. Since *Aster yukonensis* is not known to

occur in the Project Area, and is highly unlikely to occur there, there are no anticipated effects of the Upper Carroll proposed action on the species population or habitat.

Summary Analysis: No effect.

Carex lenticularis var. dolia

This sedge is known to occur in the coastal mountains of Alaska and British Columbia and the Rocky Mountains from Jasper, B.C., south to Glacier National Park, Montana. Its range in Alaska is limited to the alpine of coastal Southcentral and Southeast Alaska and the Aleutian Islands. There are nine documented occurrences in Alaska (Forest Service 1994), in Southeast, at the Mendenhall Glacier, Bailey Bay on Cleveland Peninsula, and the Chickamin Glacier. This species is not known to be found within the Project Area. Its habitat is wet alpine meadows and bare edges of snowbeds.

No observations of this species were made during field reconnaissance of harvest units and roads. This species is not known to occur in forested areas; therefore, there are no effects anticipated from timber harvest. Even so, the few high elevation roads could possibly affect a very small percentage of potential habitat.

Summary Analysis: Not likely to adversely affect.

IV. SENSITIVE SPECIES EVALUATION

Species designated by the Regional Forester as Sensitive are discussed in the preceding section, if the US Fisha and Wildlife Service has also designated them as Species of Concern.

PEALE'S PEREGRINE FALCON (*Falco peregrinus pealei*)

Refer to previous discussion under American peregrine falcon (*F. p. anatum*).

OSPREY (*Pandion haliaetus*)

Ospreys occur in low numbers in Southeast Alaska during the spring/summer nesting period from late April through August. They are believed to overwinter in Mexico and Central America. All 8 documented osprey nest sites occur outside the Upper Carroll Project Area. The closest known nest is over 40 miles to the north. Nest trees in these areas consist of broken-top spruce (live or dead) and snags of western hemlock in hemlock/spruce forest types near streams or coastal beaches. Historically, the Southeast Alaska population of osprey appears to have remained stable but low. It is unknown why osprey occur in relatively low numbers in this region, but available nest sites and foraging areas do not appear to be limiting factors.

Effects of Upper Carroll Proposed Action on Population or Habitat

The Upper Carroll Project is not expected to affect nesting osprey because no known nest site occurs in the Project Area, and availability of nesting and foraging areas does not appear to be a factor limiting population growth. In addition, minimal or no effect on preferred osprey habitat are expected from project activities,

because uncut buffers will be maintained near streams, lakes, and coastal areas. If nests are discovered in the Project Area, standard and guidelines outlined in the Forest Plan will be followed.

Summary Analysis: No effect.

TRUMPETER SWAN (*Cygnus buccinator*)

The swan is the largest waterfowl species in the world. Its present range is only a vestige of the once vast region of North America that it frequented in both summer and winter (Bellrose 1980). Trumpeter swans breeding in Alaska spend the winter along the Pacific Coast from the Alaska Peninsula to the mouth of the Columbia River, where they take advantage of open waters of saltwater estuaries and freshwater lakes and rivers. Trumpeter swans are present in the Project Area primarily during the fall and early spring migration periods and during winter. The only documented nesting trumpeter swans occur north of the Project Area at Yakutat (19 pairs). Nests in Southeast Alaska occur in wetlands and/or riparian habitat along streams, rivers, lakes and ponds.

Carroll Creek estuary and Neets Bay area are resting stops/wintering areas for swans in the Project Area.

Effects of Upper Carroll Proposed Action on Population or Habitat

Most timber harvest activity will not be in conflict with the TLMP Draft Revision (1996) standards and guidelines for trumpeter swans, since swans are not present in the Project Area when most of the timber harvest activity occurs. There is a potential for conflict when swans are migrating through or returning to wintering areas on Carroll Creek estuary and Neets Bay. Noise from road construction, timber harvest, and hauling of logs could frighten swans away from their preferred resting and feeding areas. However, limiting timber harvest operations to periods when swans are not present (April 1 through November 1) will mitigate these potential impacts for the units that are within a half mile of the Carroll Creek estuary and Neets Bay (see Mitigation Measures, Chapter Two). The following units are located within 0.5 mile of these areas:

1	13	14	17
24	27	28	29
30	35	37	38
40	41	43	47
48	90	104	106
107	110	133	

Summary Analysis: Not likely to adversely affect.

Edible Thistle (*Cirsium edule*)

This regionally endemic thistle species is distributed primarily along coastal Oregon, Washington, and British Columbia and barely reaches southern most Southeast Alaska. The only documented occurrence is near Hyder in interior Southeast Alaska near the border of canada (Forest Service 1994). It is unknown whether this species occurs in the Project Area. Its habitat in Alaska is characterized as wet meadows and open woods along glacial streams.

No observations of this species were made during field reconnaissance and no sightings have been documented in the Project Area. Since timber harvest activities generally avoids wet meadows and stream margins where this species would be expected to be found, no direct effects from timber harvest are anticipated even if the species were to occur in the Project Area.

Summary Analysis: No Effect.

DAVY MANNAGRASS (*Glyceria leptostachya*)

This grass species is distributed from Southeast Alaska to central California. Its distribution in Alaska is limited to central and southern Southeast Alaska. It is known to occur in only two documented locations: near Wrangell Alaska and on Prince of Wales Island, however it is easily overlooked and likely to be more widespread in Southeast (Forest Service 1994).

During botanical surveys in the Project Area, several specimens were collected that appeared to be *Glyceria leptostachya*. These specimens have been sent to other botanists for consensus. This species was found in a muskeg in the vicinity of harvest unit 21 (unit 313 in the NOI). No impacts to this population as a result of road construction and timber harvest are anticipated because stream and lakeshore buffers should provide adequate protection for this plant. Any undiscovered populations may be affected py the project.

Summary Analysis: May Affect Individuals, Not Likely to Adversely Affect Population Viability.

WRIGHT FILMY FERN (*Hymenophyllum wrightii*)

This fern species occurs in coastal areas of Southeast Alaska and British Columbia. Three sightings have been documented in Alaska and are limited to Biorka and Mitkof Islands (Forest Service 1994). It is unknown if the species occurs in the Project Area. This species appears to prefer humid shaded boulders, cliffs, tree trunks, and damp woods in the wettest maritime regions. In Alaska, it has been found in small populations on the base of trees and rock outcrops in damp woods.

No observations of this species were made during field reconnaissance and no sightings have been documented in the Project Area. Since Wright filmy fern is not known to occur in the Project Area, no effects are anticipated from Upper Carroll timber harvest activities. However, potentially undetected specimens could be affected by the removal of trees from damp woods of the Project Area.

Summary Analysis: May affect individuals, not likely to adversely affect population viability.

TRUNCATE QUILLWORT (*Isoetes truncata*)

This rooted aquatic species is known from a few widely isolated populations on Vancouver Island and southcentral Alaska on the Copper River Delta (Forest Service 1994). It is unknown if this species occurs in the Project Area. Truncate quillwort occurs in shallow water of lakes and streams.

No observations of this species were made during field reconnaissance and no sightings have been documented in the Project Area. Furthermore, due to its rooted aquatic nature, this species does not occur in forested areas nor in areas slated for road construction. Therefore, no direct effects from the Upper Carroll Project are anticipated. Even if the species does exist in the Project Area, stream and lakeshore buffers should provide adequate protection for this plant.

Summary Analysis: No Effect.

CALDER LOVAGE (*Liqusticum calderi*)

This plant species occurs in British Columbia and southcentral and Southeast Alaska. Documented occurrences in Alaska are limited to two disparate areas at Kodiak Island and Dall Island (just west of Prince of Wales Island) in Pleistocene refugia on limestone substrate (Forest Service 1994). It is unknown if this species occurs in the Project Area. Calder lovage occurs on rocky cliffs, open boggy or rocky slopes, and edges of coniferous forests. In Alaska it is known from alpine meadow habitats and edges of subalpine mixed coniferous forest.

No observations of this species were made during field reconnaissance and no sightings have been documented in the Project Area. Since Calder lovage is not known to occur in the Project Area, and since its habitat is at a higher elevation than project activities, no effects are anticipated from Upper Carroll timber harvest activities.

Summary Analysis: No Effect.

CHORIS BOG ORCHID (*Platanthera chorisana*)

In Alaska, this bog orchid species is limited to the Aleutian Islands and southern coastal areas (Forest Service 1994). Recent botanical surveys on Revillagigedo Island have revealed a minimum of 12 populations of this species, 6 of them within the Upper Carroll Project Area. This species has been found in the vicinity of harvest units 310 and 385, and adjacent to a small pond in the Carroll Creek drainage. This species has also been found on Revillagigedo Island in the Mahoney Lakes area and elsewhere. With the increasing number of observations, it is possible that this species is not as rare as previously thought.

Three populations of Choris bog orchid were found in the vicinity of harvest unit 20 (unit 310 in the NOI). Two of the three populations are protected as a result of implementing stream buffers. The third population is located in a muskeg through which the access road to unit 20 will be constructed. The road can be located to avoid the small population of Choris bog orchid. Another population was located below harvest unit 22 (unit 327 in the NOI). This population will not be affected since it is outside of the unit boundary and wood will be yarded uphill to the landing and access road. A population was also found in the planned road location to harvest unit 59 (unit 385 in the NOI). This road location will be reviewed to determine the feasibility of relocating the road. This population of Choris bog would likely be destroyed if a feasible route around it is not found. The risk of impacts to the above populations are the same for all action alternative since all of these units are in Alternatives 2-5. One other population of Choris bog orchid was found at the edge of a small pond up the Carroll Creek drainage, none of the alternatives will affect this population.

It is possible that timber harvest and road construction activities may inadvertently destroy some individual plants which have not been found. Still, many individuals exist outside road and unit locations.

Summary Analysis: May Affect Individuals, Not Likely to Adversely Affect Population Viability.

BOG ORCHID (*Platanthera gracilis*)

This species of bog orchid is limited to a small geographic range in southern most Southeast Alaska and adjacent British Columbia (Forest Service 1994). Two documented sightings have been made in Alaska near Pearse Canal and on Dall Island. It is unknown if this species occurs in the Project Area. This plant occurs

in wet open meadow habitat. It is undetermined whether the taxon of this species is distinct; if it is not, it may be more common than previously believed (Forest Service 1994).

No observations of this species were made during field reconnaissance of harvest units and roads. This species is not known to occur in forested areas; therefore, there are no effects anticipated from timber harvest or road construction activities.

Summary Analysis: Not likely to adversely affect.

LOOSE-FLOWERED BLUEGRASS (*Poa laxiflora*)

The distribution of this grass species is scattered between Southeast Alaska and Oregon. Seven sightings have been documented in Southeast Alaska near Hoonah, Sandborn Canal at Port Houghton, and Admiralty Island (Forest Service 1994). It is not known if this species occurs in the Project Area. Loose-flowered bluegrass is associated with moist, open lowland woods and open-forest meadows.

No observations of this species were made during field reconnaissance and no sightings have been documented in the Project Area. Since loose-flowered bluegrass is not known to occur in the Project Area, no effects are anticipated from Upper Carroll timber harvest activities. However, undetected specimens could potentially be affected by the removal of timber from harvest units encompassing open lowland woods and open-forested meadows.

Summary Analysis: May Adversely Affect.

STRAIGHT-BEAK BUTTERCUP (*Ranunculus orthorhynchus*)

This species of buttercup is distributed from coastal southern Southeast Alaska to adjacent British Columbia and Vancouver Island (Forest Service 1994). The closest documented occurrences to the Project Area include near Loring and Yes Bay. It is unknown if the species occurs in the Project Area. It occurs in moist, open lowland meadows and other moist open habitats.

No observations of this species were made during field reconnaissance and no sightings have been documented in the Project Area. Since straight-beak buttercup is not known to occur in the Project Area, no effects are anticipated from Upper Carroll timber harvest activities. Even if this species does occur in the Project Area, direct effects due to removal of timber from Upper Carroll harvest units are not anticipated to be significant as preferred open, moist habitats are generally avoided for timber harvest.

Summary Analysis: Not likely to adversely affect.

QUEEN CHARLOTTE BUTTERWEED (*Senecio moresbiensis*)

This species of butterweed is limited to the Queen Charlotte Islands of British Columbia and to disjunct populations in southeastern Alaska and northwestern Vancouver Island (Forest Service 1994). Five occurrences have been documented in Alaska on Prince of Wales, Coronation, and Dall Islands. It is not known if this species occurs in the Project Area. Queen Charlotte Butterweed occurs in shady wet areas and bogs of montane to alpine habitats, to open, rocky or boggy slopes, and in open, rocky heath or grass communities (Douglas 1982 in Forest Service 1994).

No observations of this species were made during field reconnaissance and no sightings have been documented in the Project Area. Since Queen Charlotte butterweed is not known to occur in the Project Area, no effects are anticipated from Upper Carroll timber harvest activities. Even if this species does occur in the Project Area, direct effects due to removal of timber from Upper Carroll harvest units are not anticipated to be significant as preferred open, moist habitats are generally avoided for timber harvest.

Summary Analysis: Not likely to adversely affect.

IV. LITERATURE CITED

ADF&G. 1993. Goshawk Ecology and Habitat Relationships on the Tongass National Forest-1993 Field Season Progress Report. USDA Forest Service Contract No. 43-0109-3-0272. Alaska Dept. of Fish and Game, Division of Wildlife Conservation. 12pp.

ADF&G. 1994. Goshawk Ecology and Habitat Relationships on the Tongass National Forest-1994 Field Season Progress Report. USDA Forest Service Contract No. 43-0109-4-0209. Alaska Dept. of Fish and Game, Division of Wildlife Conservation. 24 pp.

Agler, B.A., S.J. Kendall, P.E. Seiser, and J.R. Lindell. 1995. Estimates of Marine Bird and Sea Otter Abundance in Southeast Alaska During Summer 1994. USFWS, Anchorage and Juneau, Alaska. 49pp plus 41 figures and 4 Appendices.

Ambrose, R. E., R. J. Ritchie, C. M. White, P. F. Schempf, T. Swem, R. Kittrick. 1988. Changes in the Status of Peregrine Falcon Populations in Alaska. Chapter 11 in Peregrine Falcon Populations - Their Management and Recovery, edited by T. J. Cade, J. H. Enderson, C. G. Thelander, and C. M. White. The Peregrine Fund, Inc., Boise, Idaho. 1988.

American Ornithologists Union (AOU). 1957. Checklist of North American Birds. Fifth Edition.

Anderson, C. M. and P. M. DeBruyn. 1979. Behavior and Ecology of Peregrine Falcons Wintering Upon the Skagit Flats, Washington. Washington Department of Game. PF-79-1. 53pp.

Anderson, C. M., P. M. DeBruyn, T. Ulm, and B. Gassoin. 1980. Behavior and Ecology of Peregrine Falcons Wintering Upon the Skagit Flats, Washington: A Report on the 1980 Field Season. Washington Department of Game. 54pp.

Armstrong, R. H. and Editors of Alaska Magazine. 1983. A New Expanded Guide to the Birds of Alaska. Alaska Northwest Publishing Company, Anchorage, Alaska. p. 71.

Baker, C. S., L. M. Herman, B. G. Gays, and W. F. Stipel. 1982. The Impact of Vessel Traffic on the Behavior of Humpback Whales in Southeast Alaska. Kewalo Basin Marine Mammal Laboratory. Univ. of Hawaii, Honolulu, Hawaii.

Baker, C. S. and Louis Herman. 1983. The Impact of Vessel Traffic on the Behavior of Humpback Whales in Southeast Alaska. Kewalo Basin Marine Mammal Laboratory. Univ. of Hawaii, Honolulu, Hawaii.

Baker, C. S., L. M. Herman, A. Perry, W. S. Lawton, J. M. Strategy. 1985. Population Characteristics and Migration of Summer and Late-Season Humpback Whales (Megaptera novaeangliae) in Southeastern Alaska. Mr. Mamm. Sci. 1(4):304-323.

Bellrose, F. 1980. Ducks, Geese and Swans of North America. Stackpole Books, Harrisburg, Penn., and The Wildlife Management Institute, Washington, DC. pp. 380-384.

Bent, A.C. 1942. Life Histories of North American Flycatchers, Larks, Swallows, and their allies. U.S. Gov't. Printing Office, Smithsonian Institution, United States National Museum Bulletin 179.
Cade, T. J., J. L. Lincer, C. M. White, D. G. Roseneau, and L. G. Swartz. 1971. DDE Residues and Eggshell Changes in Alaskan Falcons and Hawks. Science 172:955-957.

Crocker-Bedford, C. 1990a. Status of the Queen Charlotte Goshawk. Planning Records, TLMP.

Crocker-Bedford, C. 1990b. Goshawk reproduction and forest management, Wildl. Soc. Bull. 18:262-269.

Crocker-Bedford, C. 1991. Goshawk Reproduction at Different Levels of Timber Harvest. Annu. Meeting Soc. Conserv. Biol. Abstracts 5:208.

Crocker-Bedford, C. 1992. A Conservation Strategy for the Queen Charlotte Goshawk in the Tongass National Forest. Unpublished, March 1992 draft. Ketchikan area, Tongass National Forest.

Crocker-Bedford, C. 1994. Conservation of the Queen Charlotte Goshawk in Southeast Alaska. Unpublished Rep., May 1994. Revision of Crocker-Bedford (1992). Tongass National Forest.

Crocker-Bedford, D.C. 1995. Northern Goshawk Reproduction Relative to Selection Harvest in Arizona. J. Raptor Research, 29:42-43.

Crocker-Bedford, and C., D. Chaney. 1988. Characteristics of Goshawk Nesting Stands. Pages 210-217 in R. L. Glinski et al., eds. Proc. Southwest Raptor Management Symposium and Workshop. Natl. Wildl Fed., Washington, D. C.

DeGraaf, R. M., V. Scott, R. H. Hamre, L. Ernst, and S. H. Anderson. 1991. Forest and Rangeland Birds of the United States. U.S.D.A. Forest Service-Ag. Handbook #688. 625 pp.

DeMeo, Thomas 1992. Letter of concurrence that Category 2 candidate plant species are not known to occur within the CPOW Project Area.

Ehrlich, P.R., D.S. Dobkin, and D. Wheye. 1988. The Birder's Handbook: A Field Guide to the Natural History of the North American Birds. Simon & Sshuster Inc., New York, NY.

Fay, F. H. 1985. Preliminary Status Survey of Selected Small Mammals. Institute of Marine Science. University of Alaska, Fairbanks. 53pp.

Fuller, T.K. 1989. Population Dynamics of Wolves in North-central Minnesota. Wildl. Mongr. 105. 41pp.

Gabrielson, I. N. and F. C. Lincoln. 1959. The Birds of Alaska. The Stackpole Company, Harrisburg, Penn., and The Wildlife Management Institute, Washington, D. C. pp. 206-211.

Godfrey, W. E. 1979. The Birds of Canada. National Museum of Natural Sciences, Ottawa, Canada. pp. 73-74.

Goldman, E. A. 1937. The Wolves of North America. J.Mamm. 18: 37-45.

Hall, E. Raymond and Keith R. Kelson. The Mammals of North America, Vol. I and II. The Ronald Press Company, N.Y. 1959.

Hass. G.R. and J.J. McPhail. 1991. Systematics and Distributions of Dolly Varden (Salvelinus malma) and bull trout (Salvelinus confluentus) in North America. Canadian Journal of Fisheries and Aquatic Sciences. Vol. 48, No. 11. Pp 2191-2211.

Hayward, G., C. Iverson, C. Crocker-Bedford, G. DeGayner, K. Titus, J. Lindell and P. Schempf. 1995. Conservation Assessment for Northern Goshawks in Southeast Alaska. Review draft for TLMP. July 1995. 115pp.

Howell, A. H. 1934. Description of a New Race of Flying Squirrel from Alaska. Journal of Mammalogy.

Jensen, W.F., T.K. Fuller, and W.L. Robinson. 1986. Wolf, *Canis lipus*, Distribution on the Ontario-Michigan Border near Sault Ste. Marie. Can. Field-Naturalist 100:363-366.

Johnsgard, P. A. 1990. Hawks, Eagles, and Falcons of North America, Biology and Natural History. Smithsonian Inst. Press, Washington. 403pp.

Johnson, D. R. 1989. Body Size of Northern Goshawks on Coastal Islands of British Columbia. Wilson Bull. 101:637-639.

Kennedy, P. L. 1988. Habitat Characteristics of Cooper's Hawks and northern Goshawks nesting in New Mexico. Pp. 218-227 *in* R.L. Glinski et al., eds. Proceedings of the Southwest Raptor Management Symposium and Workshop. Natl. Wildl. Fed. Sci. and Tech. Series No. 12.

Kennedy, P. L. 1989. The Nesting Ecology of Cooper's Hawks and Northern Goshawks in the Jamez Mountains, NM---a Summary of Results, 1984-1988. U.S. Dept. Agric., For Ser., Final Rep. Contract P.O. # 43-8379-8-346. 21pp.

Kennedy, P. L., and D. W. Stahlecker. 1993. Responsiveness of Nesting Northern Goshawks to Taped Broadcasts of Three Conspecific Calls. Journal of Wildlife Management. 57:249-257.

Kenward, R. E. 1982. Goshawk Hunting Behavior, and Range Size as a Function of Food Habitat Availability. J. Anim. Ecol. 51:69-80.

Kirchoff, M.D. 1992. The Alexander Archipelago Wolf. Pp. 166-186. In: Suring, L.H. et al. A Strategy for Maintaining Well-distributed, Viable Populations of Wildlife Associated with Old-Growth Forests in Southeast Alaska. Report of an Interagency Committee. Review Draft, Juneau, Alaska. April 1992. 307 pp.

Kuletz, Kathy 1991. Identification of Upland Habitats used by Wildlife affected by the EVOS: Marbled Murrelets. Restoration Feasibility Study No. 4. Final Report, USFWS w/revisions 5/12/92. 34pp.

Marshall, David B. 1988. Status of the Marbled Murrelet in North America: With Special Emphasis on Populations in California, Oregon, and Washington. U. S. Fish and Wildlife Service, Biological Report 88(30). 19pp.

Marshall, D. B. 1992. Status of the Northern Goshawk in Oregon and Washington. Audubon Society, Portland. 35pp.

McCarthy, C., W. D. Carrier, and W. F. Laudenslayer. 1989. Coordinating Timber Management ctivities with Raptor Nesting Habitat Requirements. Pages 229-235 *in* B. G. Pendleton, C. E. Ruibal, D. L. Krahe, K. Steenhof, M. N. Kochert, and M. N. LeFrack, Jr., eds. Proc, Western Raptor Management Symposium and Workshop. Matl, Wilsl. Fed. Sci. and Tech. Ser. 12.

McGowan, J. D. 1975. Distribution, Density, and Productivity of Goshawks in Interior Alaska. U. S. Dept. Inter., Fed. Aid Wildl. Rest. Proj. Rep. W-17-3, W-17-4, W-17-5, W-17-6, Job 10.6R. Final Report. 65pp.

Mech, L.D. 1977. Productivity, Mortality, and Population Trends of Wolves in Northeastern Minnesota. J. Mamm. 58(4):559-574.

Mech, L.D., S.H. Fritts, G.L. Radde, and W.J. Paul. 1988. Wolf Distribution and Road Densities in Minnesota. Wildl. Soc. Bull. 16:85-87.

Meehan, William R. 1974. The Forest Ecosystem of Southeast Alaska, 4. Wildlife Habitats. U. S. D. A. Forest Service General Technical Report PNW-16. 32 pp.

Mendenhall, Vivian M. 1992. Distribution, Breeding Records, and Conservation Problems of the Marbled Murrelet. H. Carter and M. Morrison (Eds.) Proceedings of the Western Foundation of Vertebrate Zoology. Vol. 5 No. 1.

Merriam, C. Hart. 1900. Papers from the Harriman Alaska Expedition. I. Descriptions of Twenty-six New Mammals from Alaska and British North America. Proceedings of the Washington Academy of Sciences, Vol. II: 13-30.

Muller, Mary C. 1991. Field Guide to Rare Vascular Plants of the National Forests in Alaska. USDA Forest Service, Juneau Ak. R10-MB-128. 63pp.

Murray, David F. and Robert Lipkin. 1987. Candidate Threatened and Endangered Plants of Alaska. University of Alaska Museum, Fairbanks Alaska.

National Marine Fisheries Service. 1991. Recovery Plan for the Humpback Whale (Megaptera novaeangliae). Prepared by the Humpback Whale Recovery Team for the National Marine Fisheries Service, Silver Spring, Maryland. 105pp.

Nemoto, T. 1970. Feeding Patterns of Baleen Whales in the Ocean. pp. 241-381 in J. H. Steele (ed), Marine Food Chains. Oliver and Boyd, Edinburgh.

Noble, R. E. and P. Harrington. 1978. Snag Characteristics in Old-Growth Forests on Prince of Wales Island in Alaska. U. S. D. A. Forest Service, Juneau, AK. 88pp.

Norris, Kenneth S. and Randall R. Reeves (ed). 1978. Report on a Workshop On Problems Related to Humpback Whales (Megaptera novaeangliae) in Hawaii, U. S. Marine Mammal Commission. Washington, D. C. Report No. MMC-77/03 (available from National Technical Information Service PB-280794).

Palmer, R. 1975. Handbook of North American Birds, Volume 3. Yale University Press, London, England. pp. 323-344.

Patla, S. 1991. Nothern Goshawk Monitoring Report #2, 1990. USDA Forest Service, Targhee Nat. For., Final Report P.O. # 43-02s2-0-0184. St. Anthony, Idaho. 42pp.

Paton, P.W.C. and C.J. Ralph 1988. Geographic Distribution of the Marbled Murrelet in California at Inland Sites during the 1988 Breeding Season. Nongame Bird and Mammal Section, California Dept. Fish and Game, Sacramento, CA, Job II.B.2. 35pp.

Pease, B. 1973. Effects of Log Rafting and Dumping on the Marine Environment of Southeast Alaska. Thesis, Univ. of Washington.

Pederson, s. 1982. Geographical Variation in Alaskan Wolves. Pp. 345-361 in Harrington, F.H., and P.C. Paquet (eds.). Wolves of the World: Perspectives of Behavior, Ecology, and Conservation. Noyes Publications, Park Ridge, NJ.

Peltier, W. and C. Weber, eds. 1985. Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms. EPA 600/4-85-113. U.S. Environmental Protection Agency, Cincinati, OH.

Peskall, D. B. 1976. Peregrine Falcons (Falco peregrinus) and Pesticides. Canadian Field-Naturalist 90:301-307.

Peskall, D. B. and L. F. Kiff. 1979. Eggshell Thinning and DDE Residue Levels Among Peregrine Falcons, Falco peregrinus: A Global Perspective. Ibis 121:200-204.

Peterson, R.T. 1990. A Field Guide to Western Birds. Houghton Mifflin Co., Boston, MA.

Ralph, C.J., P.W.C. Paton, A. Zakis, and G. Strachan. 1990. Breeding distribution of the Marbled Murrelet in Redwood National Park and vicinity during 1988. pp. 57-70 In C.van Riper, et al. (Eds.). Examples of Resource Inventory in National Parks of California. U.S. Dept. of the Interior, National Park Service, Washington D.C. Transactions and Proceedings, Series No. 8

Ralph, C.J., G.L. Hunt Jr., M.G. Raphael, and J.F. Piatt. 1995. Ecology and Conservation of the Marbled Murrelet in North America: an Overview. In: Ecology and Conservation of the Marbled Murrelet (C.J. Ralph et al. eds.) Pacific Southwest Research Station, USDA Forest Service. Gen. Tech. Report PSW-GTR-152. Pp. 3-23.

Ratcliffe, D. A. 1969. Population Trends of the Peregrine Falcon in Great Britian. Pages 239-269 in J. J. Hickey, ed., Peregrine Falcon Populations, Their Biology and Decline. Univ. Wis. Press, Madison.

Reeves, R.R., B.S. Stewart, and S. Leatherwood. 1992. The Sierra Club Handbook of Seals and Sirenians. Sierra Club Books, San Francisco.

Reynolds, R. T. 1983. Management of Western Coniferous Forest Habitat for Nesting Accipiter Hawks. USDA Forest Service, GTR RM-102. 7pp.

Reynolds, R. T. 1989. Accipiters. Pages 92-101 in B. G. Pendleton et al., ed., Proc. Western Raptor Management Symposium and Workshop. Natl. Wildl. Fed., Washington, D. C.

Reynolds, R. T. and E. C. Meslow. 1984. Partitioning of Food and Niche Characteristics of Coexisting *Accipiter* During Breeding. Wilson Bull. 90:182-196.

Reynolds, R. T., Graham, M. H. Reiser, R. L. Bassett, P. L. Kennedy, D. A. Boyce, Jr., G. Goodwin, R. Smith, and E. L. Fisher. 1991. Management Recommendations for the northern Goshawk in the Southwestern United States. USDA Forest Service, Southwest Region, Albuquerque, N.M. 184 pp.

Robbins, C.S., B. Bruun, and H.S. Zim. 1983. A Field Guide to Identification of Birds of North America. Golden Press. New York, NY.

Rosenberg, K. V. and M. G. Raphael. 1986. Effects of Forest Fragmentation on Vertebrates on Douglas-Fir Forests. Pages 263-272 *in* J. Verner, M.L. Morrison, and C. J: Ralph, eds., Wildlife 2000: Modeling Habitat Relationships of Terrestrial Vertebrates. Univ. Wisc. Press., Madison.

Schempf, P.F. 1981. Unpublished survey information. US Fish and Wildlife Service.

Schempf,P.F. 1982. Unpublished survey information. US Fish and Wildlife Service.

Schuster, W. C. 1980. Northern Goshawk Nest Site Requirements in the Colorado Rockies. Western Birds 11:89-96.

Stebbins, R.C. 1985. Western Amphibians and Reptiles. Houghton Mifflin Co., Boston, Massachusetts.

Suring, L.H., E.J. DeGayner, R.W. Flynn, M.L. Orme, L.C. Shea, R.E. Wood. 1988. Habitat Capability Model for Gray Wolves in Southeast Alaska. Review draft. 16 pp.

Taverner, P. A. 1940. Variation in the American Goshawk. Condor 42:157-160.

Theil, R.P., 1985. Relationships Between Road Densities and Wolf Habitat Suitability in Wisconsin. Amer. Midl. Naturalist 113(2):404-407.

Titus, K., C.J. Flatten, and R.E. Lowell. 1994. Northern Goshawk Ecology Habitat Relationships on the Tongass National Forest (goshawk nest sites, food habits, morphology, home range and habitat data)-Final Annual Project Report. USDA Forest Service Contract No. 43-0109-0272. Alaska Dept. of Fish and Game, Division of Wildlife Conservation. 69pp.+ appendices.

U. S. Fish and Wildlife Service. 1982. Pacific Coast Recovery Plan for the American Peregrine Falcon. Prepared by the U. S. Fish and Wildlife Service in Cooperation with The Pacific Coast American Peregrine Falcon Recovery Team. 87pp.

U. S. Fish and Wildlife Service (USFWS). 1982. Peregrine Falcon Recovery Plan, Alaska Population. Prepared by the U. S. Fish and Wildlife Service in Cooperation with the Alaska Peregrine Falcon Recovery Team. 69pp.

U. S. Fish and Wildlife Service. 1992. Endangered and Threatened Wildlife and Plant Species: Determination of Threatened Status for the Wash. Ore. and Calf. Population of Marbled Murrelet. Federal Register 57 (191): 45328-45337.

U. S. Department of Commerce-National Marine Fisheries Service. April, 5 1991.
Emergency Listing of Steller Sea Lion. Federal Register 55 (66).

US Department of Commerce-National Marine Fisheries Service. January 15, 1996. Northwest Salmon Home-page. http://kingfish.spp.nmfs...intyr/fish.html.

USDA Forest Service. Forest Service Manual (FSM) Chapter 2670, Threatened, Endangered. and Sensitive Plants and Animals.

USDA Forest Service. 1982. National Forest System Land and Resource Management Planning. Federal Register 47:43026-43052.

USDA Forest Service. 1989. 1989-1994 Operating Period for the Ketchikan Pulp Company Long-term Sale Area - Final Environmental Impact Statement, Volume 6. Tongass National Forest, R10-MB-66f.

USDA Forest Service. 1990. Old-growth Habitats and Associated Wildlife Species in the Northern Rocky Mountains. Publ. R1-90-42, Northern Region, Missoula, MT.

USDA Forest Service. 1991a. Management Guidelines for the Northern Goshawk in the Southwest Region, Federal Register 56(199):51672-51680.

USDA Forest Service. 1991b. Tongass Land Management Plan, Supplement to the Draft Environmental Impact Statement, Proposed Revised Forest Plan. R10-MB-146. Alaska Region, Juneau, Alaska.

USDA Forest Service. 1992. Management Guidelines for the Northern Goshawk in the Southwest Region, Federal Register 57(199):27424-27435.

USDA Forest Service, Alaska Region. 1992. Recommended Management Guidelines for the Northern Goshawk Management Area. Unpublished. Juneau, Alaska.

USDA Forest Service Alaska Region. 1994. Interim Habitat Management Guidelines for Maintaining Well-distributed Viable Wildlife Populations within the Tongass National Forest. Draft Environmental Assessment. USDA Forest Service, Alaska Region, Juneau, Alaska.

USDA Forest Service. 1994. A Working Guide to the Sensitive Plants of the Alaska Region. USDA Forest Service, Alaska Region, Juneau, Alaska.

USDA Forest Service. 1996. Tongass Land Management Revision, Revised Supplement to the Draft Environmental Impact Statement, Proposed Revised Forest Plan. R10-MB-314. Alaska Region, Juneau, Alaska.

Van Ballenberge, V., A.W. Erickson, and D. Byman. 1975. Ecology of the Timber Wolf in Northeastern Minnesota. Wildl. Monogr. 43. 43 pp.

Ward, L. Z., D. K. Ward, and T. J. Tibbitts. 1992. Canopy density Analysis at Goshawk Nesting Territories on the North Kaibab Ranger District, Kaibab National Forest. P.O. # 43-8156-0-0487. Nongame and Endangered Wildlife Program, Arizona Game and Fish Dept. , Phoenix. 61pp.

Webster, J. D. 1988. Some Bird Specimens from Sitka, Alaska. Murrelet 69:46-48.

West, J.N. 1991. Late Winter Swan Survey results on the Ketchikan Area-Tongass National Forest 1989-1991. Memorandum reply to 2630 from J.N. West, Wildlife Biologist, USDA Forest Service, Ketchikan, Alaska, to C. Crocker-Bedford, USDA Forest Service, Ketchikan, Alaska.

West, E.W. 1993. Rare Vertebrate Species of the Chugach and Tongass National Forests, Alaska. Report of Alaska Natural Heritage Program, The Nature Conservancy, Anchorage, AK. 254 pp.

White, C. M. 1974. Hunting Range of A Breeding Peregrine Falcon on the Sagavanirktok River. (Unpubl. Rept.). Brigham Young Univ., Provo, Utah, and U. S. Fish and Wildlife Service, Anchorage, AK.

Wing, Bruce L. and Kenneth Krieger. 1983. Humpback Whale Prey Studies in Southeastern Alaska, Summer 1982. Northwest and Alaska Fisheries Center, Auke Bay Laboratory. National Marine Fisheries Service, NOAA. Auke Bay, Alaska.

Woodbridge, B., and P.J. Detrich. 1994. Territory Occupancy and Habitat Patch Size of Northern Goshawks in the Southern Cascades of California. Studies in Avian Biology 16: 83-87.

DOCUMENTATION OF CORRESPONDENCE WITH OTHER AGENCIES

June 5, 1987:	U.S. Fish and Wildlife Service memorandum, recommended changing the Prince of Wales flying squirrel from a Category 2 candidate species to a Category 3c candidate species.
Dec. 4, 1990:	NMFS publishes final rule in the Federal Register listing the Steller sea lion as a threatened species.
March 20, 1991:	Interagency Wildlife Technical Committee Meeting.
April 2-4, 1991:	Marbled murrelet workshop sponsored by the USFWS.
Sept. 5, 1991:	USF&W letter critique of USDA Forest Service Region 3 Management Guidelines for the Nothern Goshawk in the Southwestern Region, (56 FR 122, 28853).
Dec. 17, 1991:	Status report on R10 sensitive species candidates.
Jan. 28, 1992:	Forest Service letter to NMFS requesting list of T & E species in proposed project areas.
Feb. 6, 1992:	NMFS letter listing humpback whale and Steller sea lion as being within the central Prince of Wales project area.
March 5, 1992:	Letter from USFWS concerning T & E in Lab Bay, Prince of Wales, Polk and Revilla timber sale areas.
April 8, 1992:	Phone conversation with NMFS about the status of recovery plans for whales and the Steller sea lion, and proposed regulations for approaching marine mammals.
April 8, 1992:	Letter to USFWS requesting updated list of T & E and proposed and candidate species.
April 9, 1992:	Phone conversation with the Alaska Natural Heritage Program to check on any changes in the listing of candidate plants.
April 15, 1992:	Letter from USFWS updating the list of threatened, endangered, and candidate species likely to occur on the Forest.
April 17, 1992:	Phone conversation with the USFWS clarifying that the Aleutian Canada goose is not likely to occur on the Forest.
June 24, 1992:	USDA Forest Service memo describing current status of goshawk call survey.
Aug. 13, 1992:	USF&W letter critique of USDA Forest Service Region 3 Management Guideline Revision for the Northern Goshawk in the Southwestern Region, (57 FR 119, 27424).
Aug. 18, 1992:	Interim habitat recommendations for the northern goshawk, USDA Forest Service, Alaska Region, Juneau.
Sept. 8, 1994:	Meeting with ADF&G and USFWS on Upper Carroll Project old-growth retention strategy.

APPENDIX D

Oct. 27, 1994:	Letter from USFWS in response to the Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) for timber harvest in the Upper Carroll Project Area.
April 9, 1996:	Letter from USFWS in response to request for list of threatened or endangered species within the Upper Carroll Project Area.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Southeast Alaska Ecological Services
3000 Vintage Blvd., Suite 201
Juneau, Alaska 99801-7100

IN REPLY REFER TO:

July 31, 1996

Jimmy J. Dehererra
District Ranger
Ketchikan Ranger District
Tongass National Forest
3031 Tongass Avenue
Ketchikan, AK 99901

Dear Mr Dehererra:

The U.S. Fish and Wildlife Service (Service) has reviewed the biological assessment, dated July 12, 1996, for threatened and endangered species that may occur in the vicinity of the proposed Upper Carroll timber sale, Alaska. The assessment evaluated the effects of proposed actions on the endangered American peregrine falcon (Falco peregrinus anatum) and Eskimo curlew (*Numenius borealis*), and threatened Aleutian Canada goose (*Branta canadensis leucopareia*).

For the purposes of Section 7 consultation, we agree that populations of the American peregrine falcon will not likely be adversely affected, and there will be no effect on Eskimo curlew or Aleutian Canada goose populations, as a result of the proposed project.

Although not specifically required by the consultation provisions of the Endangered Species Act, we appreciate your consideration of other species that may be vulnerable, in the biological assessment. Your consideration of these species is important for their conservation and assists in preventing their inclusion on the Endangered Species list.

These comments are offered for endangered and threatened species for which the U.S. Fish and Wildlife Service has responsibility under Section 7 of the Endangered Species Act of 1973 (16 USC 1521 et seq.) and its amendments. The above comments are specific to the Endangered Species Act and do not reflect agency concerns regarding other organisms or habitats for which the Service has legislated responsibilities.

USDA FOREST SERVICE
KETCHIKAN
RANGER DISTRICT
RECEIVED
AUG 3 '96

	RANGER
	PLANNING
	FISH / WLDF
	REC/LANDS
	SILVI
	S.S.S.
	TMBR

Sincerely,

John Lindell
Endangered Species Biologist

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

August 2, 1996

USDA FOREST SERVICE
KETCHIKAN
RANGER DISTRICT
RECEIVED
AUG 7 '96

	RANGER	
	PLANNING	
	FISH / WLDF	
	RECLANDS	
	SILVI	
	S.S.S.	
	TM?R	

Mr. Jimmy J. Dehererra
District Ranger
Ketchikan Ranger District
3031 Tongass Avenue
Ketchikan, Alaska 99901

Dear Mr. Dehererra:

The National Marine Fisheries Service (NMFS) has reviewed your Biological Assessment for the Upper Carroll Creek Timber Sale, located approximately 35 miles north of Ketchikan in the Carroll Creek drainage. This project is subject to Section 7 consultation under the Endangered Species Act of 1973, as amended (ESA)(50 CFR 402 *et seq*).

We concur with your assessment that the proposed action will not affect any listed threatened or endangered species under NMFS jurisdiction or their critical habitats. This concludes consultation on this action. Should any aspect of the action change so as to increase the likelihood that ESA species may be affected, you would need to reinitiate consultation. Should you have any questions regarding this concurrence, please contact Andrew Grossman, Protected Resources Management Division, (907) 586-7358.

Sincerely,

for Steven Pennoyer
Director, Alaska Region

cc: Braham, NMML

Appendix E

Unit Crosswalk Table

UNIT CROSSWALK TABLE

Key Terms

Logging Systems Transportation Analysis (LSTA)—The design of all potential harvest units, associated logging and transportation systems.
Notice of Intent (NOI)—Notice of a proposed action published in the Federal Register and local newspapers.
Environmental Impact Statement (EIS)—A statement of environmental effects for a major federal action which is released to the public and other agencies. A Draft EIS (DEIS) is released for public comment and is followed by the Final EIS (FEIS) in conjunction with the Record of Decision (ROD).
Harvest Unit Number—Number assigned to an individual harvest unit. The number is used to track a particular unit from the planning and implementation stage on through the post sale monitoring and cultural treatments.

Unit Numbering History

The USDA Forest Service initially prepares an LSTA for each project to determine where potential harvest units and roads are located. Logging systems engineer's assign preliminary unit numbers at this time. An interdisciplinary team (IDT) of resource specialists then review the LSTA and recommend how various settings should be combined into units for harvest. The Upper Carroll IDT assigned new unit numbers for those units that were reconfigured. These were the unit numbers published in the NOI and scoping packages. It was later discovered that other national data bases used by the Forest Service accept only 3 digit unit numbers. Therefore a different unit number was assigned for use in both the Draft and Final EIS.

The enclosed crosswalk table will allow the reader to relate discussions of a particular unit described in the DEIS and FEIS to the map that was included in the scoping package, newspaper ad and NOI sent to the public in the fall of 1994.

Appendix E

Table E-1
Crosswalk Table

EIS UNIT NUMBER	NOI UNIT NUMBER	LSTA UNIT NUMBER
1	1000	744-524
2	1001	744-374
3	1002	744-342
4	1003	744-499
5	1004	744-498
6	1005	744-480
7	1006	744-479
8	1007	744-381
9	1008	744-389
11	1010	744-489
12	1011	744-489
13	1012	737-754
14	1013	737-732
16	1015	744-417
17	1016	737-639
18	1017	744-513
19	308	744-308
20	310	744-310
21	313	744-313
22	327	744-327
23	335	744-335
24	338	744-338
25	339	744-339
26	344	744-344
27	345	744-345
28	346	744-346
29	347	744-347
30	348	744-348
31	349	744-349
32	350	744-350
35	353	744-353
36	354	744-354
37	355	744-355
38	356	744-356
40	358	744-358
41	359	744-359
42	360	744-360
43	362	744-362
44	363	744-363
45	364	744-364
46	365	744-365
47	366	744-366
48	367	744-367
49	368	744-368
50	370	744-370

Table E-1
Crosswalk Table

EIS UNIT NUMBER	NOI UNIT NUMBER	LSTA UNIT NUMBER
51	371	744-371
52	372	744-372
53	375	744-375
54	376	744-376
55	378	744-378
56	380	744-380
57	382	744-382
58	384	744-384
59	385	744-385
60	386	744-386
61	396	744-396
62	400	744-400
63	416	744-416
64	418	744-418
65	420	744-420
66	421	744-421
67	423	744-423
68	424	744-424
69	425	744-425
70	426	744-426
71	429	744-429
72	430	744-430
73	431	744-431
74	437	744-437
76	445	744-445
77	447	744-447
78	452	744-452
79	454	744-454
80	456	744-456
81	462	744-462
82	464	744-464
83	466	744-466
84	471	744-471
85	494	744-494
86	497	744-497
87	523	744-523
88	532	744-532
89	533	744-533
90	534	744-534
91	545	737-545
92	547	737-547

Appendix E

Table E-1
Crosswalk Table

EIS UNIT NUMBER	NOI UNIT NUMBER	LSTA UNIT NUMBER
93	572	737-572
94	584	737-584
95	603	733-603
96	619	737-619
97	620	737-620
98	622	737-622
100	625	737-625
101	628	737-628
102	630	737-630
103	631	737-631
104	638	737-638
105	639	737-639
106	643	737-643
107	644	737-644
109	732	737-732
110	753	737-753
111	757	746-757
119	776	746-776
120	779	746-779
121	780	746-780
125	823	746-823
127	825	746-825
128	950	737-950
130	952	744-952
131	953	744-953
132	954	744-954
133	955	744-338
134	956	744-365
135	957	744-335
138	960	744-381
139	NA	744-498
140	362	744-362
141	346	744-346
142	345	744-345
143	1003	744-499

Appendix F

Watershed Report

Watershed Analysis

The focus of this analysis is to evaluate watershed and salmonid habitat in the Neets and Carroll Creek Watersheds. The goal of this study is to describe the condition of fish habitat as affected by hydrology, geomorphology, soils, vegetation, and climate within the two watersheds. The following objectives must be met to accomplish this goal:

1. Describe existing conditions and trends in watershed processes and habitat condition.
2. Describe habitat distribution in the watersheds.
3. Identify sensitive areas in the watersheds.
4. Design a strategy to protect sensitive areas and important salmonid habitat.
5. Analyze potential risks associated with proposed management activities.
6. Identify monitoring needs.

Watershed Assessment requires the use of both computer models and field work. Analytical tools and field analysis will be used to determine levels of sensitivity for key areas within each watershed. They will also be used to identify areas that are important for maintaining the integrity and function of riparian areas and stream channels as related to fish habitat. This report will also provide a strategy and site-specific recommendations to provide for long-term stability of riparian, channel, and fish habitat conditions.

Location

The 47,942 acre Upper Carroll Project Area is located approximately 30 air miles northeast of Ketchikan, Alaska. It encompasses an area of northcentral Revillagigedo Island that extends from the head of Carroll Inlet north to Neets Bay.

Carroll Creek and its tributaries drain most of the Upper Carroll Project Area. The headwaters of Carroll Creek originate in the north part of the project area and flow southward, entering saltwater at the head of Carroll Inlet. Several small tributary streams enter Carroll Creek from the east, draining the western flanks of Mount Reid and its associated summits. The Carroll Creek drainage contains a number of small, unnamed lakes, mostly on the west side of the valley. The Carroll Creek watershed encompasses an area of approximately 32,000 acres. Also included in the Upper Carroll Project Area is the Neets Creek Drainage. Neets Creek headwaters are just to the north of the headwaters of Carroll Creek across a low divide. Neets Creek drains to the west, flowing through a broad valley before entering saltwater at the head of Neets Bay. The Neets Creek system includes two lakes, Neets and Bluff, in its middle to lower reaches. The Neets Creek watershed covers about 9,000 acres.

The remaining acreage in the Project Area is comprised of minor watersheds. The majority of these watersheds are located adjacent to the west side of Carroll Inlet, north of Shelter Cove. In general, the additional streams do not have the desired combinations of spawning, rearing and over-wintering habitat to support large populations of salmon and do not warrant a watershed-level analysis.

Watershed Description

Fisheries

Carroll Creek (ADF&G No. 101-45-78) supports anadromous runs of steelhead (*Oncorhynchus mykiss*), king (*O. tschawytscha*), pink (*O. gorbuscha*), coho (*O. kisutch*), and chum salmon (*O. keta*). The creek also sustains populations of Dolly Varden (*Salvelinus malma*), cutthroat (*O. clarki*) and rainbow (*O. mykiss*) trout. The mainstem of Carroll Creek is approximately six miles in length with the lower 2.5 miles accessible to anadromous salmonids. Approximately 2.5 miles upstream from Carroll Inlet is a bedrock waterfall that appears to be a complete barrier to upstream migration of anadromous salmonids.

To date, there is no documentation to support that the king salmon run is indigenous. Chinook were first introduced in 1961 with stocks from Soos Creek (Green River) in Washington State. Then, in 1987, SSRAA started to release pen-reared chinook hatched at Whitman and imprinted in Carroll Inlet. The permit from the Alaska Department of Fish and Game (ADF&G) states that all returns must be captured. The intent of this stipulation is to prevent chinook from straying into Carroll River and competing for habitat with the native summer run of chum. Since 1986, SSRAA has annually released up to 1.2 million smolts.

Carroll Creek has a fairly large estuary (170 acres) with numerous tidal channels that are utilized by estuarine fish for feeding during high tides. The estuary is characterized by extensive grass flats which are inundated at higher tides down to mud flats and eel grass beds which are exposed at minus tides.

On Neets Creek, a short distance (0.1 mile) above its outlet, a 15 foot barrier falls blocks the migrating salmon from traveling upstream. Farther upstream, a southern branch leads to Neets Lake where cutthroat may be found. A little farther up the valley lies Bluff Lake, named for its steep sides. Originally a cutthroat lake with kokanee salmon, no kokanee have been caught for more than 10 years. Only in the short intertidal zone are there any spawning areas for pink, chum and Dolly Varden.

Hydrology

The Carroll River Watershed covers an area of approximately 42 square miles and is comprised of numerous sub-basins and reaches as shown in Figure F-1. The main channel begins in sub-basin S1 near the headwaters and flows through reaches R1, R2, R3, R4 and R6 into the estuary at the top of Carroll Inlet. The main channel is fed by nine 2nd and 3rd order tributaries which flow from sub-basins S1 through S9.

The Neets Bay Watershed covers an area of approximately 13.6 square miles and is comprised of ten sub-basins and reaches as shown in Figure F-2. The main channel begins in sub-basin S1 near the headwaters, flows through reach R1 to the inlet of Bluff Lake, and continues from the outlet through reach R4 into Neets Bay. The main channel above the lake in reach R1 is fed by sub-basins S1 and S2 draining the headwaters. The main channel below the lake is fed by sub-basins S5 and S7. Sub-basin S4 and reaches R2 and R3 empty into Bluff Lake.

Figure F-1
Carroll River Watershed

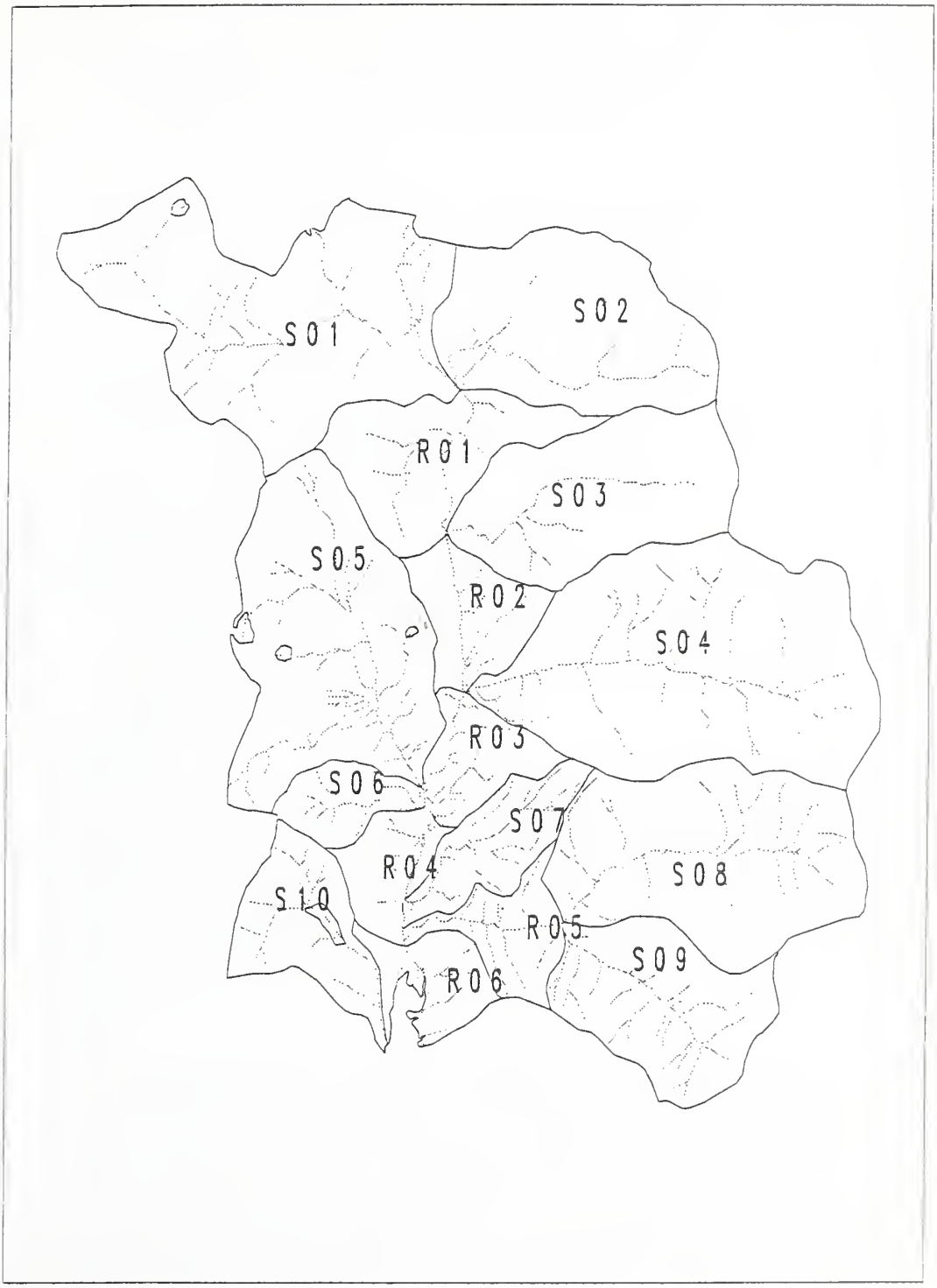
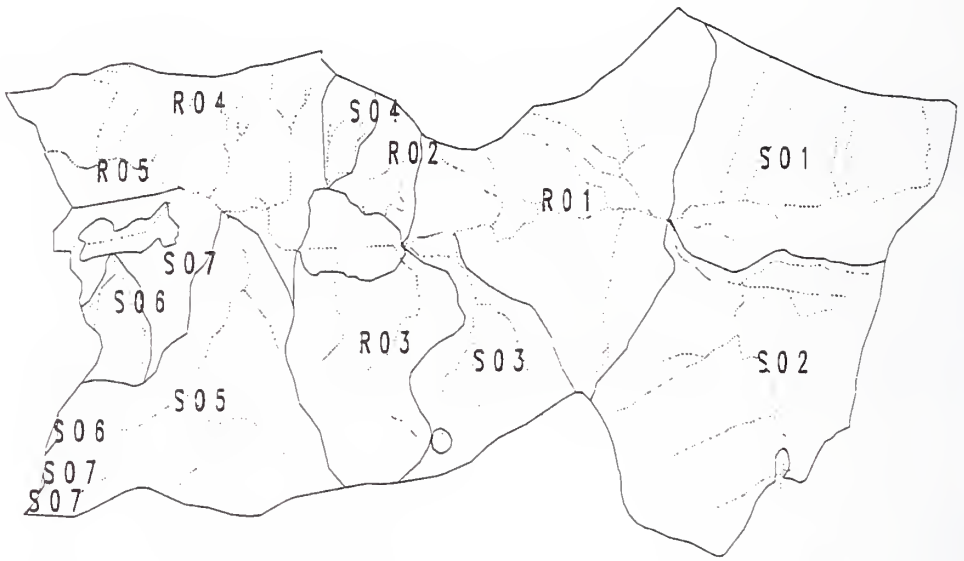


Figure F-2
Neets Bay Watershed



Stream Channel Types

Stream channel features are used to type and map Tongass National Forest streams. Stream channel substrate, gradient, large woody debris, sideslope characteristics, and riparian vegetation influence stream channel stability, sensitivity to disturbances, and sediment transport. Streams are grouped into process groups with similar features:

Floodplain (FP) and Palustrine (PA) process groups

- Low-gradient channels with low stream energy store fine sediment.
- Stability varies; stream channels are generally sensitive to disturbance.
- High quality fish habitat.

Alluvial Fan (AF) process group

- Low to moderate gradient channels periodically transport and store large quantities of sediment.
- Stability depends on large woody debris, stream channels, periodically change course.
- Lower gradients and large woody debris support fish habitat.

Moderate Gradient (MM) and Large Contained (LC) process groups.

- Streams readily transport sediment.
- Stability depends on bedrock, riparian vegetation, or large woody debris.
- Often good quality fish habitat.

High Gradient Contained (HC) process group

- High energy streams rapidly transport sediment.
- Bedrock frequently provides channel stability, but adjacent sideslopes are often unstable.
- Large woody debris may store sediment, but may also form debris jams and initiate channel-scouring debris torrents.
- Limited fish habitat.

Landforms

The dominant topographic feature in these watersheds is the mountain ridge, the highest on Revillagigedo Island, which borders the east side of the Carroll Creek valley. Generally the topography of these watersheds is typical of that of Pleistocene glaciated valleys in the Alexander Archipelago. The Carroll Creek and Neets Creek valleys have the typical U-shape with broad, relatively flat bottoms and steep sideslopes which are topped by broad, rounded mountain ridges. Hanging side valleys, which contain cirque lakes or steep gradient mountain tributaries with numerous falls, are common. Elevations range from sea level to 4,592 feet on the summit of Mount Reid, although most mountain ridges in the area average about 2,600 to 3,000 feet high.

Geology

The Carroll Creek and Neets Creek watersheds have been heavily modified by Pleistocene and post-Pleistocene glaciation. The area is characterized by fjords, glaciated valleys, and ridges that trend in an east-west direction from the former centers of glacial origin in the mountains to the east. The features characteristic of glaciated coastal areas are easily recognized in the watershed. Southeast Alaska has one of the best developed fjord systems in the world; deep channels, such as Carroll Inlet and Neets Bay were carved to great depths by coastal glaciers. The geology of the central part of Revillagigedo Island consists mainly of a group of metamorphosed and deformed rock strata including dark-gray slate, phyllite and graywacke, andesitic or basaltic volcanic rocks, conglomerates and inclusions of gabbro and

diorite. Running through these bedded rocks are locally abundant dikes and sills of granodiorite and quartz diorite. While the masses of gabbro and diorite, which make up the core of these mountains, form relatively stable structures, the slates, phyllites and graywackes which overlay or are adjacent, form landscapes susceptible to landslides and other erosion processes.

Soils

The soils of Revillagigedo Island are found on a variety of terrains shaped by glaciation and characterized by U-shaped valleys with mountains extending 2,000 to 3,000 feet above sea level. Glacial till of variable thickness occurs in the valley bottoms and up to 1,500 feet on the sideslopes. Many of the valleys have numerous rocky knobs scoured by glaciation.

Soil development in Southeast Alaska is influenced by high levels of rainfall, cool maritime temperatures, and moderately-low annual soil temperatures. Under these conditions, organic matter decomposes slowly, resulting in a thick layer of organic material. Disturbances also play an important role in the development of Southeast Alaskan soils. Windthrow, flooding, and landslides are important types of disturbance that alter the soil surface and subsoil. In general, the other ecosystem components, parent material, topography, vegetation, animals, and climate influence the features of soils that affect and are affected by timber harvest activities. Soils influence the overall ecosystem functions, vegetation composition, water quality, riparian area and wetland values, and productivity of timber, fish, and wildlife in the area.

Most undisturbed soils in the area are resistant to surface erosion because they are generally protected by the surface layers of organic matter and the roots of vegetation. However, when mineral soils are exposed, erosion can occur. The rate of erosion depends primarily on the amount of vegetation ground cover, erodibility of the soil, and the steepness of slope. Locations where the surface erosion and mass wasting are most likely to occur are along stream banks, snowslide or avalanche tracts, and within V-notches.

Landslides are the dominant process of natural erosion in ecosystems of Southeast Alaska. Many landslides occur during or immediately after periods of heavy rainfall when soils are saturated. Landslides usually occur on steep slopes that have soils with distinct subsurface failure surfaces, such as contacts with compact basal till, or bedrock that slopes parallel to the ground surface.

Vegetation

The vegetation of the Carroll and Neets Creek watersheds includes a range of forested and non-forested types that occur in southern Southeast Alaska. These types many generally be described as:

Alpine Heaths

Alpine heaths occupy high elevations throughout most of the area above elevations ranging from 2,000 to 2,500 feet. Heaths characteristically are dominated by dwarf, shrubby, evergreen members of the heather family, with other common species such as black crowberry, partridge-foot, and bird's beak lousewort. The ground cover forms a springy carpet, often so dense that it obscures everything underfoot, including rocks and holes. Alpine heaths are similar to the A1 ecological land type of Babik, 1995 and typically include the Hydaburg soil.

Mountain Meadows

Mountain meadows are less extensive than heaths, but are lush, wet, and dominated by forbs. Typical species include arrow-leaved groundsel, subalpine daisy, Sitka valerian, artic lupine, Indian hellebore, gentians, sedges, and grasses such as purple mountain hairgrass. Mountain

meadows are analogous to the A2 ecological landtype and typically include the Sunnyhay soil series.

Alpine Rocklands

Alpine rocklands include rock outcrops, cliffs, boulder fields, fellfields, talus and scree slopes, wet runnels, gullies, and avalanche tracks. The plant cover is usually sparse and discontinuous, but it includes many different saxifrages as well as ferns, sedges and many species of lichens and bryophytes.

Subalpine Forest

Subalpine forest is characteristic of areas with a substantial, persistent winter snowpack. These conditions prevail only at high elevations, generally above 1,500 feet. Mountain hemlock and Alaska yellowcedar are the characteristic species, although subalpine fir may also occur in the area. Sitka spruce can be a significant component of the subalpine forest. This is similar to the F6 ecological landtype of Babik, 1995, and typically includes the St. Nicholas and Tolstoi soil series.

Perhumid Rainforest

Perhumid rainforest dominates low and middle elevations. Western hemlock is the most common tree in this zone. Sitka spruce is common throughout, especially along rivers and shorelines. Alaska yellow-cedar and western redcedar are commonly found on wetter sites, where they are often small or stunted and often occur with mountain hemlock. The perhumid rainforest includes the F1, F2, F4 and F5 ecological landtypes. The dominant soils are the Kupreanof, Tolstoi and Maybeso series.

Freshwater Marshes and Fens

Freshwater marshes and fens occur where freshwater carries relatively high amounts of nutrients and are not highly acid. They are dominated by sedges and grasses, Sitka sedge, bluejoint grass, tufted hairgrass, and small-flowered bullrush. Shrubs such as Douglas spirea, sweet gale, Pacific crab apple, and Sitka willow are common along marsh edges and streambanks. Freshwater marshes and fens are similar to the F2 and F3 ecological landtypes. Common soils include the Kina and Maybeso series.

Bogs or Muskegs

Bogs or muskegs are highly acid peatlands with stagnant waters that originate as rain or snow falling directly onto the bog; they do not transport nutrients in runoff from adjacent areas. These wetlands are dominated by Sphagnum mosses. Characteristic shrubs include Labrador tea, bog rosemary, bog laurel, bog blueberry, and cranberry. Stunted, gnarled shore pine, Alaska yellow-cedar, western redcedar, and both hemlocks are typically scattered around these bogs. The colloquial term 'muskeg' is used to refer to the complex mosaic of fens, bogs, pools, streams, and scrubby forestland that is common to the area. Bogs are analogous to the M1 ecological landtype and typically include the Maybeso and Kogish soil series.

Rocky Shores

Rocky shores are the most common type of shoreline within these watersheds. Terrestrial plant cover is sparse, especially on exposed rocky headlands and cliffs. Adaptations to salt spray and moisture stress include cushion and matted growth forms and thick, waxy, succulent or densely hairy leaves. Sea plantain, hairy cinquefoil, giant vetch, chocolate lily, and salal are typical of the hardy vegetation of the exposed rocky shores.

Shingle Beaches

Shingle beaches, composed of large gravels or cobbles, are also widespread in the project area. They usually support clumps of searocket, dunegrass, beach pea, giant vetch, and cinquefoil. Such plants are especially common on the upper beaches and among the piles of

driftwood at the winter storm high tide line. Included in this ecosystem are the Salt Chuck and Sokolof soil series.

Sandy Beaches

Sandy Beaches are uncommon in the project area. They occur mainly as small pockets in the *Rocky Shores* and *Shingle Beaches*. Vegetation is sporadic, but showy species such as searocket, beach-carrot, and beach pea occur. Further up the beaches large-headed sedge, dune grasses, paintbrushes, lupines, and silverweed become common.

Tidal Marshes

Tidal marshes are the most productive maritime plant communities, especially those with brackish or low-salinity water, such as the relatively large estuary of the Carroll Creek delta. Soils are usually fine-textured and rich in organic matter and nutrients, supporting lush meadow vegetation. Grasses and sedges, especially tufted hairgrass, Lyngby's sedge and dune wildrye dominate, but these marshes also support silverweed, springbank clover, lupine and giant vetch. Tidal marshes include the D1, D2, and D3 ecological landtypes of Babik, 1995.

Climate

The climate and weather in Southeast Alaska have a strong maritime influence. The dominant pressure cells originate in the North Pacific from the Japanese current and cold Artic down drafts. Some weather cells move southeastward and push into the Alaska/British Columbia coastal area, bringing relatively warm, moist air. These pressure cells produce strong winds and large amounts of precipitation when they meet the rugged coastline. Precipitation in Southeast Alaska ranges from 90 to more than 200 inches per year.

The yearly distribution of precipitation is fairly uniform over the southern half of southeastern Alaska. October is generally the wettest month. High precipitation persists through the middle of November when intermittent snowfall occurs. Snow accumulation below 500 feet in elevation is short-lived, generally melting off within a few days because of warmer temperatures and rain. At the higher elevations, the snow cover usually persists until the spring. From the latter part of March through the latter part of June, rain dominates. July and August are, on the average, the drier months. Rain becomes more frequent and of greater duration during September. Unusually dry weather in 1993 was followed by an October storm that has been estimated at a 20-year event. The maritime influence holds the daily and seasonal temperatures within a narrow range. Temperatures average near 32 degrees Fahrenheit in the winter and 60 degrees in the summer.

Surface water in the Upper Carroll Project Area has its origin in the abundant precipitation described above. Estimated mean annual precipitation in the area ranges from less than 120 inches at sea level at the head of Neets Bay to over 200 inches at the summit of Mt. Reid. Much of the precipitation at higher elevations is received as snow. As a result of abundant snowpack, which may persist into late summer along the mountain ridge that forms the western edge of the study area, the snowmelt runoff is an important contribution to flows in Carroll Creek, particularly during lowflow periods in mid-to-late summer.

Wind Processes

Temperate rainforests are highly susceptible to wind damage because of the combination of shallow root systems, poorly drained soils, and high winds when they occur during peak rain events. The most common disturbance is blowdown of a single tree or small group of trees. Wind is a major disturbance factor in Southeast Alaska, altering the structure of the forest. Scattered windthrow of large over-mature trees is a prime cause of mortality and creates small openings in which the advance growth in the understory may develop.

Over 80% of the gale-force winds reported between the years 1953 and 1978, were from the south or southeast. Gale force winds occur during every month of the year and come from all directions. However, the vast majority of gale-force winds come out of the southeast and occur during the fall and winter months when heavy rains have saturated the soils.

Blowdown is a natural process in the Upper Carroll Project Area. Windthrow along stream riparian areas is a primary source for instream large woody debris, and maintain and creating fish habitat. However, management activities, such as clearcuts and roads next to streamside riparian areas can greatly increase the rate of blowdown along a stream and negatively impact future stream habitat conditions. The site-specific effects of blowdown in the Project Area are further described later in this document.

Management History

Previous harvest within the Project Area has largely used clearcut logging methods. Previous timber harvests have occurred within the project are for both long term and the independent sale program. About 20% of the suitable base, or 9.5 percent of the commercial forest land (approximately 2,065 acres) has been previously harvested from the Upper Carroll Project Area excluding encumbered lands.

Values and Associated Issues

Description of Uses and Values

The Upper Carroll and Neets Bay watersheds are located within Value Comparison Units (VCU) 744 and 737 respectively. The Tongass Land Management Plan has designated these VCUs as LUD IV, where opportunities are provided for intensive resource use and development, with emphasis on commodity or market resources.

Under the long-term timber sale contract with Ketchikan Pulp Corporation, these watersheds provide a component of regular timber volume to meet contractual obligations. Timber production and its contribution to the economy of local communities will probably continue to be an important use and value of the Upper Carroll and Neets Creek watersheds.

Fisheries values for Upper Carroll include contributions to the sport and commercial catch in Southeast Alaska. Both the Carroll Creek and the Neets Bay watersheds are listed in the current Forest Habitat Integrity Plan (FHIP). FHIP I listings are cooperatively developed with ADF&G and based on sportfish data, pink salmon escapement, and coho production. FHIP I designation requires additional protection under the 1996 Draft Tongass Land Management Plan Revision (Option 2 - Riparian Standards and Guides). FHIP I listings are currently under revision as part of the Tongass Land Management Revision process. Subsistence use has also been documented in the Project Area.

SSRAA operates a hatchery at Neets Bay and is dependent on the Neets Creek Watershed for a supply of sediment-free water. In addition, the chum brood-stock for the hatchery originated from egg takes in Carroll Creek. If for some reason it was necessary for the hatchery to rebuild their brood-stock, future egg takes would be required from Carroll.

Desired Condition For Upper Carroll and Neets Bay

The proposed Tongass Land Management Plan Revision contains standards and guidelines for fish and riparian areas in the Upper Carroll and Neets Bay watersheds. The objectives include maintaining fish habitat capability, stream bank and stream channel processes, large woody debris supply, water quality (including temperature), and fish passage through stream-crossing structures. The Regional Watershed Analysis Team provides specific Riparian Habitat Management Objectives (RHMOs) based on analysis of pristine watersheds in the Tongass National Forest (Table F-1.)

Table F-1
Riparian Habitat Management Objectives Expressed in Percentiles

Habitat Feature	Channel Type or Process Group	Regional Percentiles 25%	50%	75%
Pieces of LWD/ 1,000 square meters	LC&MC	6	15	22
	FP3	10	32	54
	FP4	8	24	34
	FP5	4	5	6
	HC	16	35	65
	MM1	27	45	82
	MM2	33	35	44
Percent Pool Area (of total by C-Type)	LC	8	20	27
	MC	11	22	39
	FP3	20	53	76
	FP4	35	47	59
	FP5	47	51	60
	MM1	28	40	52
	MM2	2	22	39

Large Woody Debris Distribution

Large woody debris (LWD) is measured as pieces of LWD per 1,000 square meters of channel type. Large woody debris is defined as woody material greater than ten centimeters diameter and one meter in length that is a functional component of the stream channel. Large woody debris plays an important role in alluvial stream channel structure and stability. It also provides fish cover and creates complex streamflow patterns that scour pools and trap spawning gravels.

Pool Area

Pool Area is measured as the percent of pools in the total area of channel type. Pools are very important salmonid habitat features. They provide refugia, fish rearing habitat, cover, and optimal spawning habitat at pool tails.

Erosion Rates and Sediment Delivery Processes

The desired future condition for the Carroll and Neets Creek watersheds is to minimize sediment sources and sediment transport to salmonid habitat. No quantitative information is available to support specific objectives. The State has established a maximum percent accumulation of fine sediment in spawning substrate, but the variability associated with substrate analyses is high enough to question the utility of such criteria in evaluation of aquatic habitat protection.

All ground-disturbing projects are to be implemented using Best Management Practices (BMPs), which have been specifically developed to minimize soil erosion and sediment transport (USDA Forest Service 1993).

Water Quality

The desired future condition for water quality in the Project Area is to maintain the State-designated beneficial uses. The criteria established to protect beneficial uses ('growth and propagation of fish, shellfish, other aquatic life, and wildlife') includes water quality standards for stream temperature, dissolved oxygen, pH, turbidity, total dissolved solids, and sediment. Stream temperature must not exceed 20°C at any time; it must not exceed 15°C in migration routes and rearing areas; and it must not exceed 13°C in spawning, egg, and fry incubation areas. Dissolved oxygen must not be less than 7 mg/l. The pH must be between 6.5 and 9.0 and not vary more than 0.5 pH units from natural conditions. Turbidity must be less than 25 NTUs over natural conditions. Total dissolved solids must be less than 1500 mg/L.

Current Conditions and Relevant Processes

Distribution of Habitats

Streams within the Project Area support important populations of anadromous and resident salmonids. The streams currently support native runs of pink, chum, and coho salmon, as well as Dolly Varden char, coastal cutthroat, and steelhead (rainbow) trout.

Stream Classification

The Ketchikan Area's Geographic Information System (GIS) maps streams according to an Aquatic Habitat Management Unit (AHMU) classification system. Originally, three classifications of streams and lakes, named Aquatic Habitat Management Units (AHMU), were identified for the Tongass National Forest. In a letter dated November 21, 1995, the Regional Forester outlines a more comprehensive classification system in response to recommendations in the Anadromous Fish Habitat Assessment Report (AFHA). Stream Class definitions are now as follows:

- *Class I*—Streams with anadromous or adfluvial lake and stream habitat; or high quality resident fish waters listed in Appendix 68.1, Region 10 Aquatic Habitat Management Handbook (FSH 2609.24), June 1986; or habitat above fish migration barriers known to provide reasonable enhancement opportunities for anadromous fish.

- *Class II*—Streams with resident fish populations and generally steep (often 6-15 percent) gradient (can also include streams from 0-5 percent gradient where no anadromous fish occur). These populations have limited sport fisheries values. These streams generally occur upstream of migration barriers or are steep gradient streams with other habitat features that preclude anadromous or adfluvial fish use.

- *Class III*—Perennial and intermittent streams with no fish populations, but which have sufficient flow or transport sufficient sediment and debris to have an immediate influence on downstream water quality or fish habitat capability. These streams generally have bankfull widths greater than 5 feet and are highly incised into the surrounding hillslope.

- *Class IV*—Other intermittent, ephemeral, and small perennial channels with insufficient flow or sediment transport capabilities to have an immediate influence on downstream water quality or fish habitat capability. These streams generally are shallowly incised into the surrounding hillslope.

- *Non-streams*—Rills and other watercourses, generally intermittent and less than 1 foot in bankfull width, with little or no incisement into the surrounding hillslope, and with little or no evidence of scour.

This stream classification system will be incorporated as an update to the Region 10 Aquatic Habitat Management Handbook. The addition of Class IV and Non-streams classification categories should not change existing stream protection requirements contained in existing timber sale contract provisions and the BMP Handbook. These new stream class categories will result in more accurate delineation of streams in the field (BMP 13.3), and more uniform and objective implementation of stream channel protection measures (BMP 13.16). As this direction was signed after most field reconnaissance was completed, Class IV streams will be identified by Fisheries Biologists during harvest unit layout.

Table F-2 displays a summary of Class I, II, and III stream miles by VCU (based on watershed boundary).

Table F-2
Aquatic Habitat by VCU

VCU No.	Watershed	Miles-Class I	Miles-Class II	Miles-Class III
744	Carroll	20.2	35.1	93.3
737	Neets	12.2	.8	42.1

Most of the original inventory was based on aerial photo interpretation and reflects the likelihood of stream channel types containing fish habitat. Field reconnaissance (including Basin Wide and Road Condition Surveys) conducted for this project, were used to verify habitat and fish presence in many stream reaches. Field verification also led to stream inventory updates, particularly of Class II and Class III stream channels.

Table F-3 displays GIS values for each stream process group found in the Carroll and Neets Creek watersheds.

Table F-3
Carroll Creek and Neets Creek Stream Miles By Process Group

Process Group	Carroll Creek	Neets Creek
Alluvial Fan	4.4	3.3
Estuarine	1.5	0.1
Flood Plain	12.2	3.8
High Gradient Contained	86.8	27.6
Large Contained	1.2	0.3
Moderate Contained	8.3	0.3
Mixed Moderate	9.9	1.8
Palustrine	2.3	1.0

Stream Habitat Condition

Ketchikan Ranger District personnel conducted basin wide surveys to assess the current condition of fish habitat in the Carroll Creek Watershed. In the 1994 field season, approximately 11.4 miles (18.3 km.) of fish habitat was inventoried (Bryant et al. 1993). Due to time constraints, instead of underwater visual (snorkel dive) estimates of fish densities, minnow traps were used to determine presence/absence and species composition. Data parameters collected in the habitat surveys include:

- amount and size of large woody debris within habitat units
- number, type, and size (length and width) of pools
- number and size of riffles and glides
- amount of off-channel and secondary pools
- dominant substrate size
- undercut bank area
- dominant cover types
- presence and composition of fish species

Time and personnel constraints did not allow for a complete survey of all the Class I and II stream habitat in the watershed. However, according to Overton et al. (1993), as little as 20% of a watershed can be measured to detect differences between watersheds on a temporal or spatial scale. Survey data for the watershed were pooled by channel type and sorted by habitat type for analysis. The survey data are summarized in the Carroll Creek Resource Report (Levesque, 1995). Where sample sizes were sufficient, the summarized data provide an accurate measure of quantity, type, and variability of stream habitat available within the channel types in the Carroll Creek watershed.

The regional fish habitat assessment team provided specific riparian habitat management objectives (RHMOs) based on an analysis of pristine watersheds in the Tongass National

Forest. The objectives address several habitat features important to salmonids in streams. Table F-4 compares data from the basin wide stream survey conducted on Carroll Creek in 1994 with the RHMOs.

Table F-4
Comparison of Carroll Creek Habitat Features with RHMOs Expressed in Percentiles

Habitat Feature	Channel Type or Process Group	Regional Percentiles 25%	50%	75%	Carroll Creek Value
Pieces of LWD/ 1,000 square meters	LC&MC	6	15	22	81.1
	FP3	10	32	54	116.4
	FP4	8	24	34	113.5
	FP5	4	5	6	-
	HC	16	35	65	80.7
	MM1	27	45	82	24.2
	MM2	33	35	44	48.2
Percent Pool Area (of total by C-Type)	LC	8	20	27	-
	MC	11	22	39	37.4
	FP3	20	53	76	36.4
	FP4	35	47	59	43.7
	FP5	47	51	60	-
	MM1	28	40	52	20.7
	MM2	2	22	39	34.9

The values generated from the basin wide survey data are indicative of the complex habitat in the Carroll Creek watershed. Compared to the regional data, values for large woody debris exceed the established 75 percentile with the exception of the MM1 channel type. However, the sample size for the MM1 & FP4 channel types were low and the data may not accurately portray the existing condition. Ralph et al. (1994) also found that generally large wood surveys of 1-2 km. were necessary to meet a confidence interval of 90%. Therefore, the 885 meters of MM1 surveyed may not be entirely representative.

Comparison of percent pool area to the regional values raises concern regarding the FP3 and the MM1 channel types. Pools are critical to the survival of salmonids. They provide rearing

habitat, cover, and optimal spawning habitat at pool tails. The low values for these channel types would suggest a shift in the balance between sediment supply and delivery.

After closer inspection, it was determined the majority of the FP3 reaches surveyed were located in the reach that has previously experienced timber harvest (R04). The previous harvest was conducted prior to the passage of TTRA and stream buffers were not applied.

Basin wide surveys were conducted in the Neets Bay watershed in 1995. However, due to the low percentage habitat surveyed, the data can not be extrapolated or used for comparison to the RHMOs.

Condition of Existing Roads

On June 19, 1995 District Fish Biologists walked the Upper Carroll mainline road to address all fisheries concerns from the estuary of Carroll River to Neets Bay. The road will serve as a route for transportation of logs harvested in the Project Area. This mainline road will require approximately 12.5 miles of new construction and 1.6 miles of reconstruction. A total of 94 stream crossings were identified and inventoried along this route. Twenty-three of these crossings will require fish passage and/or timing. Timing windows for instream construction have been determined based on site-specific information in regard to the presence of different species of fish. A detailed report of this survey is included in the project record. Additional road surveys are currently in progress. Any new information will be incorporated into the project as it is completed.

Sediment Transfer and Deposition Analysis Procedure

The Carroll River and Neets Bay watersheds were evaluated for sediment delivery and depositional potential using a watershed-level analysis (Geier and Loggy 1995). The watersheds were first divided into sub-basins and reaches as shown in Figures F-1 and F-2. For each sub-unit, two risk indices were developed: a Sediment Transport Index (STI) and a Sediment Deposition Index (SDI).[1] Each was composed of a series of three sub-indices based on watershed morphology, discharge, and potential sediment sources. Analysis results were field reviewed by hydrologists and fisheries biologists.

Watershed Morphology

The first component of the STI characterizes the morphology of each sub-basin and reach according to transport characteristics using the product of drainage density and relief ratio (Simons *et al.*, 1980). Drainage density (total stream length/area) is used as a measure of drainage *efficiency*. Sub-basins or reaches with greater stream length per unit area are more efficient at transporting sediment to the outlet. Relief ratio (basin relief/length) is used as a measure of basin *energy*. Sub-basins or reaches with higher relief ratios have greater gravitational energy available for sediment transport. The product is an indicator of relative sediment yield (Simons *et al.*, 1980) and is used as the geomorphic component of the STI. The geomorphic component of the SDI uses the drainage density (stream miles/mile^2) of *low*-gradient streams (< 2%) to characterize the depositional potential of each sub-basin and reach.[2]

Discharge

The geomorphic component of each index is adjusted for discharge using the estimated bankfull flow (*i.e.*, 2-year flood) for each sub-basin or reach. Streams with higher discharge have greater stream power and sediment transport capacity (Brooks *et al.* 1992). Bankfull flow, which is highly-correlated with channel formation (Dunne and Leopold 1978), was used as the reference flow and was estimated using a regional hydrologic model for Southeast Alaska (Jones and Fahl 1994).

Sediment Sources

The final transport and depositional indices were derived from the discharge-weighted geomorphic components by incorporating potential sediment sources. Four major categories were used: natural sources, harvest units, roads, and landslides (Geier and Loggy 1995). The final transport and depositional indices are called the Sediment Transport Index (STI) and Sediment Deposition Index (SDI), respectively.

Interpretation

The STI and SDI are quantitative measures of watershed morphology and disturbance which help identify and rank areas according to potential for sediment production and deposition. They do not provide yield estimates, sediment discharge estimates, route sediment, nor identify impact thresholds; but they do indicate the location and potential significance of sediment sources and depositional areas within the watershed based on measured characteristics known to correlate with sediment transport and deposition. In general, higher transport scores are observed in tributary sub-basins and those reaches with a relatively high gradient and discharge. Higher depositional scores are observed in reaches with a high density of large, low-gradient floodplain channels.

[1] In the AWRA publication, indices were called Fish Habitat Hazard (FHH) ratings. However, they are more precisely termed sediment transport and depositional indices as used in this EIS.

[2] Depositional reaches were classified using the Channel Type User Guide (USFS 1992).

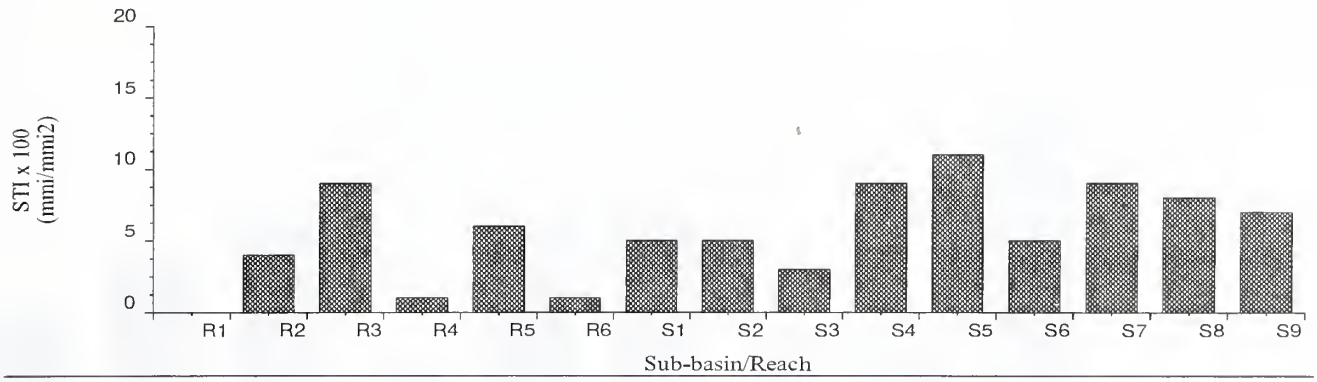
The Carroll River Watershed

The Carroll River Watershed covers an area of approximately 42 square miles and is comprised of numerous sub-basins and reaches as shown in Figure F-1. The main channel begins in sub-basin S1 near the headwaters and flows through reaches R1, R2, R3, R4, and R6 into the estuary at the top of Carroll Inlet. The main channel is fed by nine 2nd and 3rd order tributaries which flow from sub-basins S1 through S9. A sediment analysis was performed for each sub-basin and reach under existing conditions to identify potential areas of concern.

Sediment Transport Areas

The existing Sediment Transport Index (STI) for each sub-basin and reach is shown in Figure F-3. Sub-basins S4 and S5 have the highest scores followed by sub-basin S7. These sub-basins have the greatest potential to transport sediment downstream in large, rapid pulses relative to other sub-basins. Other high scores are observed in reach R3, sub-basins S7 and S8.

Figure F-3
Carroll STI by sub-basin and Reach



Sediment Depositional Areas

The existing Sediment Deposition Index (SDI) for each sub-basin and reach is shown in Figure F-4. Reaches R4 and R6 have the highest scores, indicating the highest density of large, low-gradient depositional channels. These areas are the most critical depositional reaches in the watershed—sediment transported from upstream areas will be deposited in these streams for medium-to-long term storage. All sub-basins have low SDI scores relative to reaches due to the small number of depositional streams. However, SDI scores within sub-basins can highlight *localized* depositional areas which can provide important spawning and rearing habitat. Although the absolute scores are lower than for reaches, sub-basins S1, S4, S5, and S7 have significant areas of localized deposition as shown in Figure F-5.

Figure F-4
Carroll SDI by Sub-basin and Reach

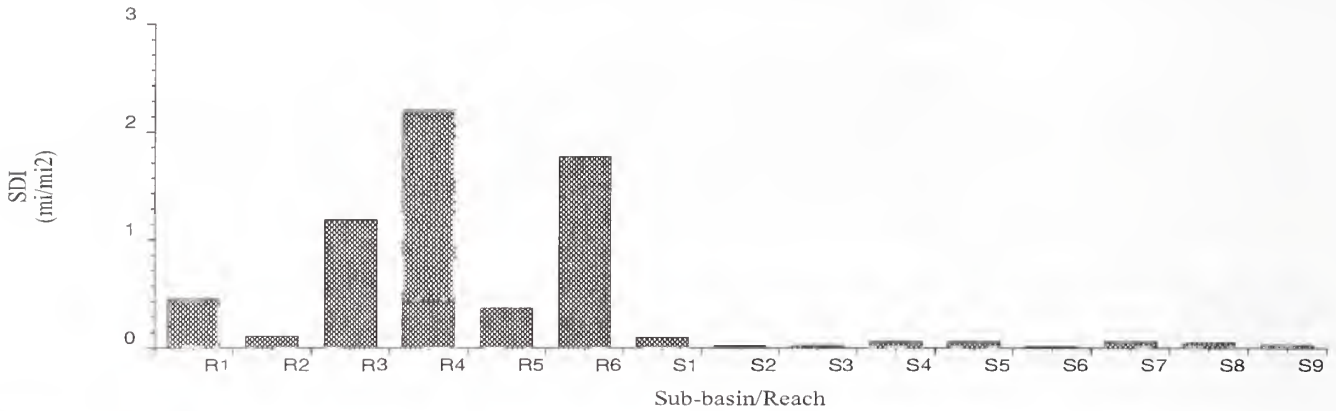
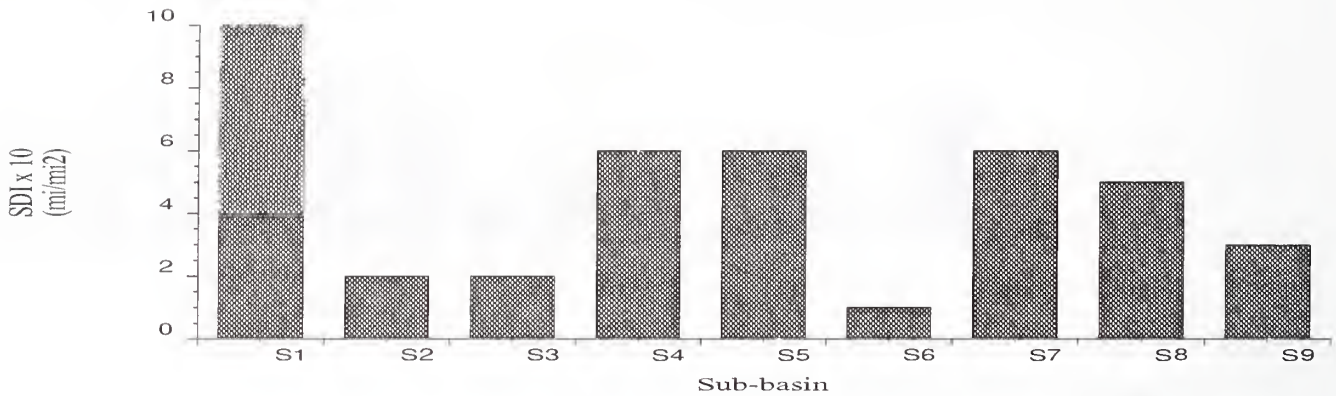


Figure F-5
Carroll SDI by Sub-basin



Watershed Hydrology

The sediment analysis can be used to identify important hydrologic processes at the watershed level. Streams draining sub-basins S1 and S2 flow into the mainstem channel in reach R1, which is a moderate size, low gradient floodplain channel (low STI). After flowing out of reach R1, the stream gradient increases significantly in reach R2 and flows through a section of moderate gradient, highly incised channels in reach R3 as indicated by the high STI score (Figure F-3). The mainstem channel in reach R3 is a high energy stream, with a series of cascades and falls, that drains the upper portions of the watershed. Water flowing out of reach R3 empties into reach R4; a large, low gradient depositional channel with multiple bars, side channels and accumulations of sediment and large woody debris (LWD). Finally, flow leaving reach R4 enters reach R6; a larger, single thread channel with considerable tidal influence and very low accumulations of LWD.

Table F-5
Miles of Depositional and Transitional Streams for the Carroll Creek Watershed by Sub-basin and Reach

Sub-basin/Reach	R1	R2	R3	R4	R5	R6	S1	S2	S3	S4	S5	S6	S7	S8	S9
Depositional	2.8	0.3	1.6	2.4	0.8	1.6	1.1	0.6	0.3	0.4	0.7	0.1	1.3	0.0	0.0
Transitional	0.0	0.0	0.0	0.0	1.3	0.0	3.3	0.1	0.2	2.7	1.7	0.2	0.0	2.5	1.3

Watershed Hydrology

The sediment analysis can be used to identify important hydrologic processes at the watershed level. Streams draining sub-basins S1 and S2 flow into the mainstem channel in reach R1, which is a moderate size, low gradient floodplain channel (low STI). After flowing out of reach R1, the stream gradient increases significantly in reach R2 and flows through a section of moderate gradient, highly incised channels in reach R3 as indicated by the high STI score (Figure F-3). The mainstem channel in reach R3 is a high energy stream with a series of cascades and falls that drains the upper portions of the watershed. Water flowing out of reach R3 empties into reach R4; a large, low gradient depositional channel with multiple bars, side channels, and accumulations of sediment and large woody debris (LWD). Finally, flow leaving reach R4 enters reach R6; a larger, single thread channel with considerable tidal influence and very low accumulations of LWD.

Critical Areas within the Watershed: Reaches R3 and R4, Sub-basins S4 and S5

Reach R3 is a critical reach in terms of both fisheries and hydrology (Figure F-1). From the fisheries standpoint, falls and cascades in reach R3 provide an effective migration barrier for anadromous fish, primarily coho salmon. As a result of the barrier, coho migration is diverted into sub-basin S5, which contains 2.4 miles of localized depositional and transitional channels (Table F-5) and provides high-complexity habitat. From the hydrological standpoint, reach R3 drains over half of the watershed and funnels the sediment and organic debris into the depositional streams of reach R4.

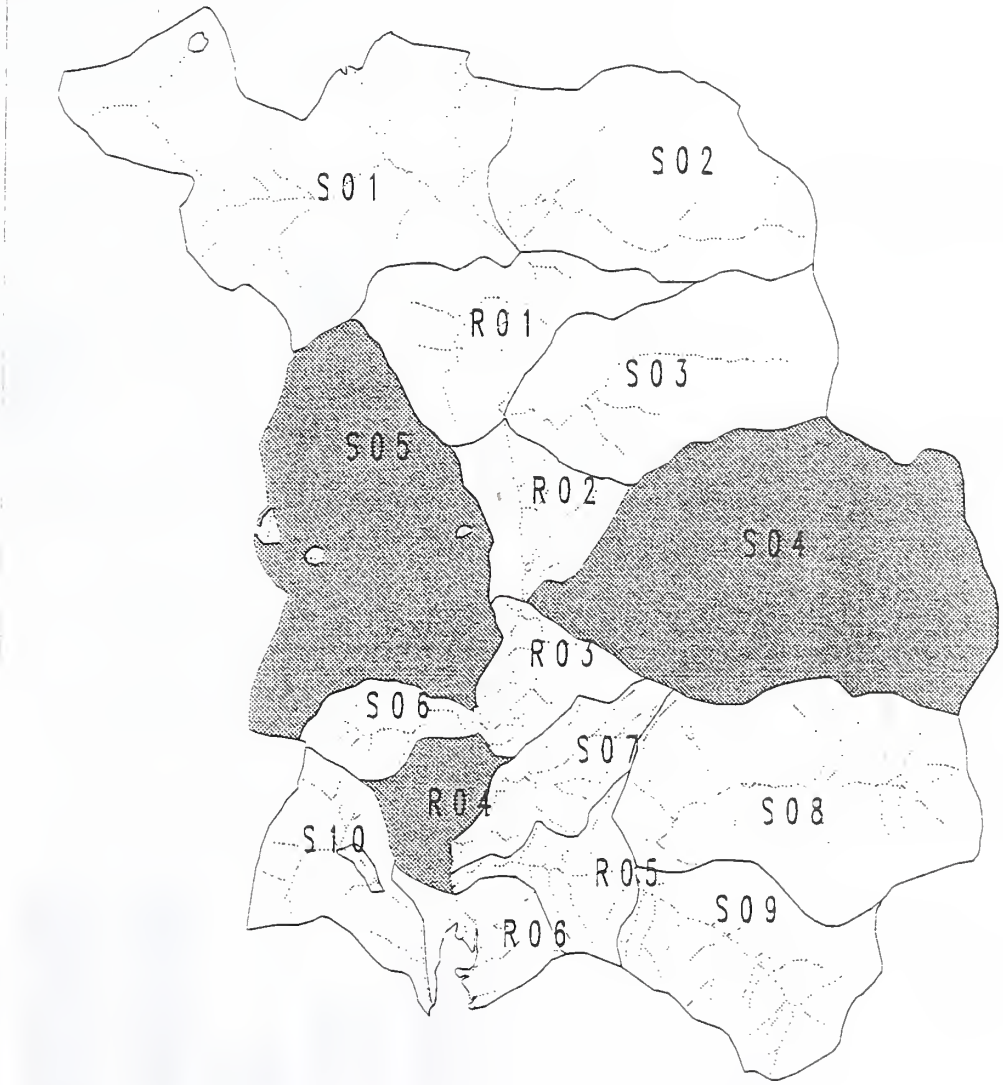
As a result, reach R4 is the most sensitive depositional reach in the watershed (Figure F-4). Discharge from over half of the watershed flows into reach R4 where woody debris, gravel bars and floodplains provide short and long-term storage for sediment. Fine sediment concentration in the bed increases in the downstream direction—particle size changes from cobble-boulder substrate at the inlet of reach R4 to sand-gravel at the outlet. Gravel substrate in the lower reaches of reach R4 provides considerable areas of spawning habitat for both pink and chum salmon.

Reach R4 is particularly vulnerable to sediment pulses from sub-basins S4 and S5. It is buffered from sub-basins S1 and S2 by a low-gradient reach R1 which acts as a temporary sediment sink (Figure F-1). Sediment from sub-basin S4, however, flows directly into reach R3 where it can be quickly transferred to depositional areas in reach R4. Similarly, sub-basin S5 flows directly into reach R4 near the inlet. Sediment inputs from sub-basins S4 and S5 flow relatively unbuffered into reach R4.

Sub-basin S4 has the second highest sediment transfer potential (STI) in the watershed (Figure F-3) with the capacity to transfer sediment readily into reach R4. In addition, sub-basin S4 itself has significant resident habitat. Sub-basin S4 is inaccessible to anadromous fish due to downstream fish barriers. However, sub-basin S4 contains 4.0 miles

of depositional and transitional streams which provide high-complexity habitat for Dolly Varden and cutthroat trout (Table F-5). Excess sediment introduced into sub-basin S4 would be quickly transported to resident fish habitat within the sub-basin, and subsequently through reach R3 to the depositional reaches in reach R4.

Figure F-6
Sensitive Sub-Basins and Reaches for Carroll



Sub-basin S5 is one of the most significant transport areas in the watershed. It has the highest sediment transfer potential (STI) of any sub-basin or reach (Figure F-3). It also has high-productivity anadromous fish habitat. Because of the barriers in reach R3, coho migration is diverted into sub-basin S5 where low-gradient channels (Table F-5, Figure F-5) provide high-complexity spawning and rearing habitat. Sediment introduced into the stream system from road-building or harvest in sub-basin S5 would quickly be transported to depositional reaches within the sub-basin and could significantly affect fish habitat. Potential impacts include degradation of spawning gravels, infilling of pools, and limiting access to off-channel rearing habitat.

To summarize, reach R4 and sub-basins S4 and S5 are the most sensitive areas of the watershed with respect to sediment (Figure F-6). Sub-basins S4 and S5 have a high transport potential with 44.9% and 54%, respectively, of their areas in high mass movement soils (MMI 3 and MMI 4). They also have localized deposition and high-complexity fish habitat in their lower reaches. Sediment transported from these sub-basins is transferred directly to depositional areas in reach R4 where it could adversely affect spawning areas for pink and chum salmon.

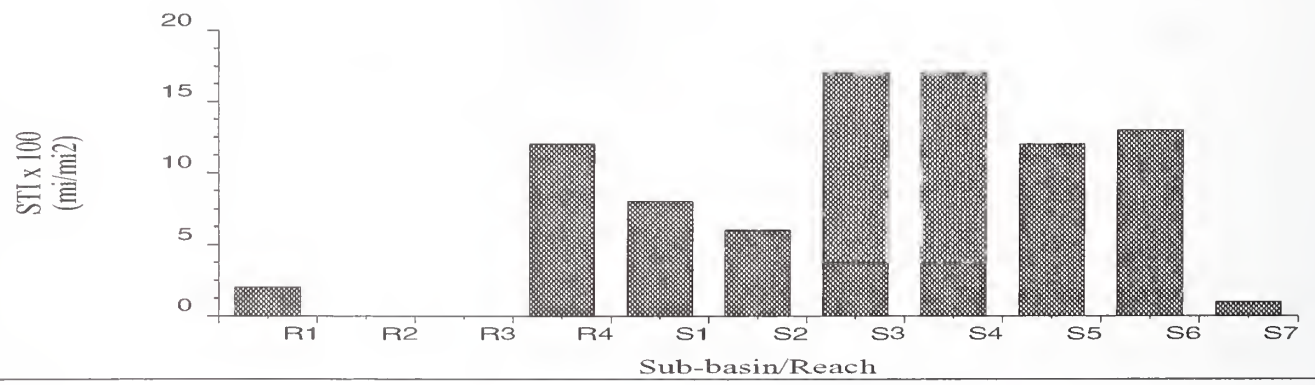
The Neets Bay Watershed

The Neets Bay Watershed covers an area of approximately 13.6 square miles and is comprised of ten sub-basins and reaches as shown in Figure F-2. The main channel begins in sub-basin S1 near the headwaters, flows through reach R1 to the inlet of Bluff Lake, and continues from the outlet through reach R4 into Neets Bay. The main channel above the lake in reach R1 is fed by sub-basins S1 and S2 draining the headwaters. The main channel below the lake is fed by sub-basins S5 and S7. Sub-basin S4 and reaches R2 and reach R3 empty into Bluff Lake. A sediment analysis was performed for each sub-basin and reach under existing conditions to identify potential areas of concern.

Sediment Transport Areas

The existing Sediment Transport Index (STI) for each sub-basin and reach is shown in Figure F-7. Sub-basins S3 and S4 have the highest STI scores, followed by sub-basin S6. These sub-basins have a higher potential than other sub-basins to transport sediment downstream in large pulses.

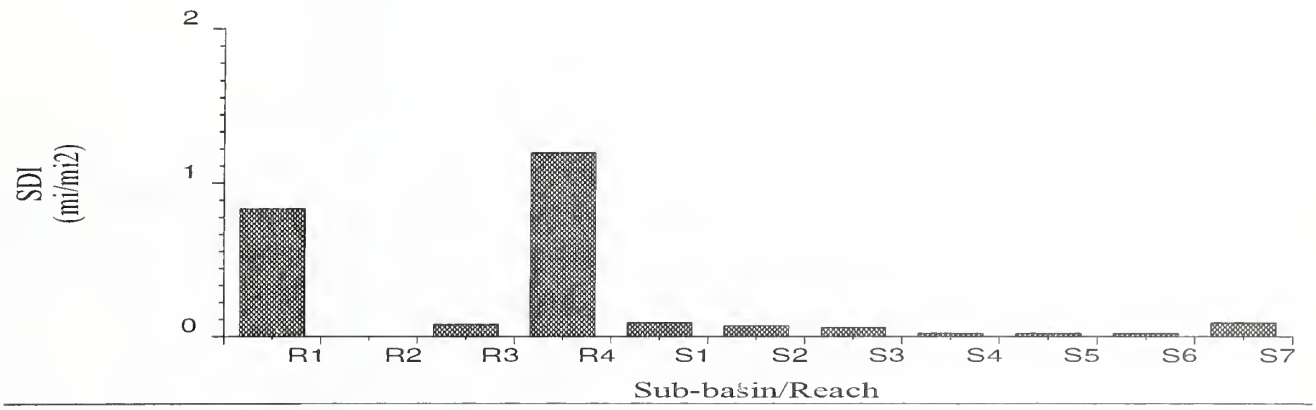
Figure F-7
Neets STI by Sub-basin and Reach



Sediment Depositional Areas

The existing Sediment Deposition Index (SDI) for each sub-basin and reach is shown in Figure F-8. Mainstem reaches R1 and R4 have the highest scores, indicating the highest density of large, low-gradient depositional channels. These areas are the primary depositional reaches in the watershed: sediment transported from upstream areas will be deposited in these streams for medium-to-long term storage. All sub-basins have low SDI scores relative to reaches due to the small number of depositional streams.

Figure F-8
Neets SDI by Sub-basin and Reach



Discussion

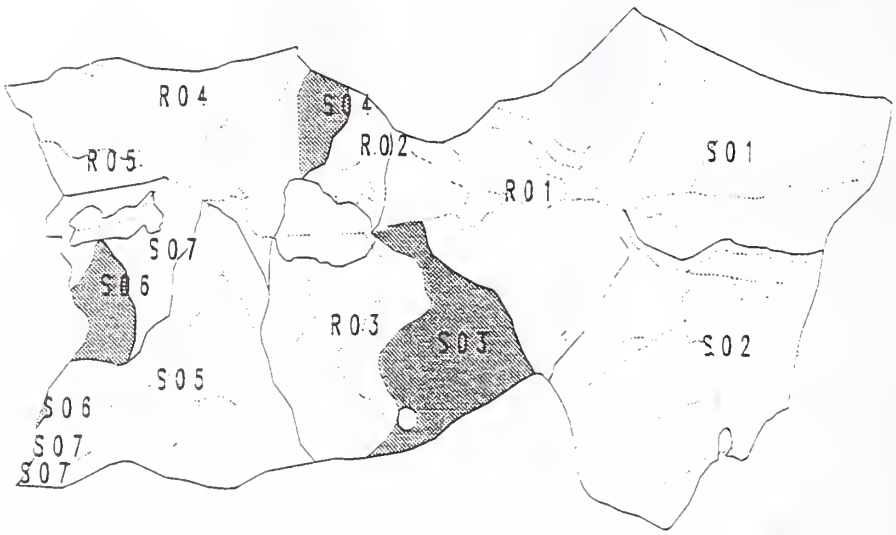
Areas with the highest STI are sub-basins S3 and S4 which drain into Bluff Lake (Figures F-6 and F-7). These are steep sub-basins with 61 and 76% of their area, respectively, in soils with high to very high mass movement potential (MMI 3 and MMI 4). Sub-basin S4 has the highest relief ratio and drainage density in the watershed (0.58 ft/ft and 9.6 mi/mi^2, respectively), which means that it has the most gravitational energy available for sediment transport and the most efficient drainage network. However, sub-basin S4 is a small drainage with low discharge (est. Q_2 = 73 cfs). Sub-basin S3 does not have the gravitational energy nor drainage efficiency of sub-basin S4, but it has higher discharge (est. Q_2 = 261 cfs), which translates to higher stream power and capacity for sediment transport.

Reaches R2 and R3 also drain into Bluff Lake (Figure F-6). They contain steep slopes draining headwall areas with 67% and 61% of their area, respectively, in MMI 3 and MMI 4 soils. The STI is not applicable to reaches R2 and R3 because flow is not concentrated through an outlet, but rather occurs as a series of 1st order streams draining the hillsides. As a result, the capacity of individual streams in these areas to transport sediment is low, but landslides and debris torrents on the steep hillsides can move large amounts of sediment directly into Bluff Lake.

Discharge from sub-basins S5, S6, and S7 enter the mainstem between the outlet of Bluff Lake and Neets Bay (Figure F-6). Sub-basin S5 has the fourth highest transport potential in the watershed, while sub-basin S6 has the third highest (Figure F-7). However, sub-basin S6 is nested in sub-basin S7 and drains into Neets Lake before entering the main channel.

Sub-basin S7 enters the mainstem midway between Bluff Lake and salt water, but most of the area drains into Neets Lake. Consequently, the transfer index (STI) for sub-basin S7 is very low (Figure F-7).

Figure F-9
High Risk Sediment Areas for Neets Bay



The hydrology of the Neets Bay watershed has to be interpreted in terms of management concerns. The watershed has no anadromous fish habitat due to migration barriers in the lower reaches. Consequently, there are no spawning or winter rearing habitat concerns for salmon in the stream itself. However, the system does contain resident populations of cutthroat trout and Dolly Varden. In addition, the Southern Southeast Regional Aquaculture Association (SSRAA) operates its largest hatchery at the outlet of the watershed. Each year the facility spawns and rears large numbers of chum salmon, along with smaller numbers of coho and king salmon to various life-stages. Eggs are incubated until fry emerge and become sufficiently mature to be outplanted to remote release sites. The eggs, in particular, are extremely sensitive to suspended sediment which can clog pores and cause suffocation, as well as affect the gill membranes of fry. For this reason, the STI should be interpreted conservatively.

Results of the sediment analysis suggest that sub-basins S3, S4, and S6 represent areas of highest risk, followed by sub-basin S5 and reach R4. Within this watershed, however, reaches R2 and R3 must also be considered because fine sediment introduced into the Bluff Lake from adjacent hillslope failures can remain in suspension and move downstream to affect the hatchery. Higher risk areas are shaded gray in Figure F-9. The analysis also suggests that sub-basins S1 and S2 are the lowest risk areas in the watershed with regard to the hatchery because of 1) low STI scores, and 2) two long intervening reaches of low-gradient stream and a lake which tend to buffer sediment pulses from these areas.

Riparian Management Strategy

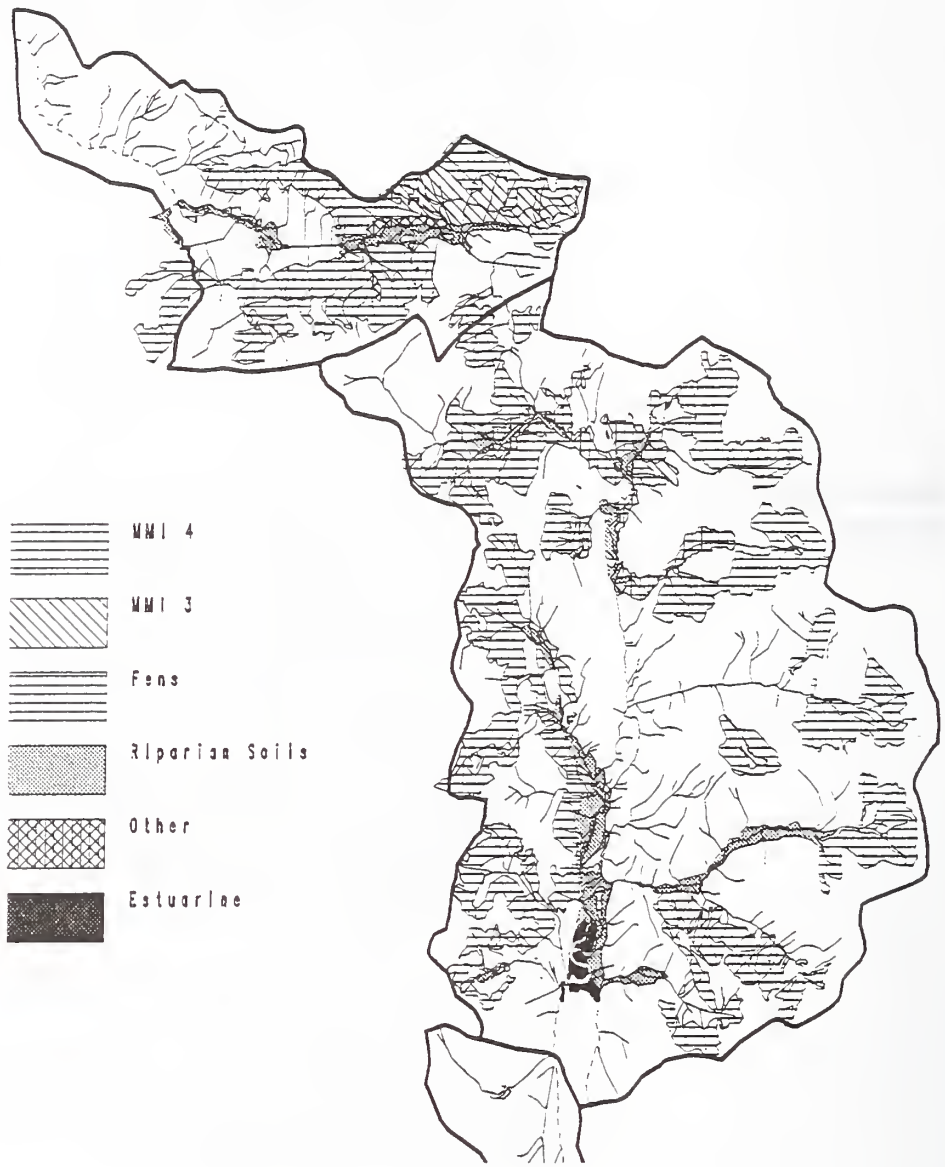
Riparian Habitat Conservation Area Design

Riparian Habitat Conservation Areas (RHCAs) are portions of a watershed that are directly coupled to streams, wetlands, lakes, and ponds. They sustain hydrologic, geomorphic, and ecological processes that affect streams, stream processes, and aquatic habitats (Federal Agency Guide for Watershed Analysis, 1994). These areas include three functional components: stream riparian zones, fens, and sediment source areas. The RHCA is a starting place for site-specific project planning efforts. The delineation of this area on a map (Figure F-10) does not prohibit timber harvest, road construction, recreational development, or any other activity within the RHCA.

These riparian conservation areas occupy portions of the Carroll and Neets Creek watersheds where the potential direct or indirect effects of management activities on fish habitat are significant. They identify the areas of greatest concern for maintaining riparian and wetland functions and hillslope stability. They are tailored to the characteristics of each individual watershed to account for variability in geology, soils, vegetation, and hydrology.

The RHCAs for the Project Area were designed on a watershed scale and adjusted during project level planning. The final RHCA for the Project Area is the combined mapping of several functional resource components. High quality salmonid habitat forms the core of the RHCA. Much of this habitat is found in the floodplain streams and tributaries of Carroll Creek. The stream RHCA component was designed to express riparian forest processes important to salmonid habitat for all Class I and Class II streams. The remaining components used to create the RHCAs are riparian vegetation, sensitive soils, sideslope stability, landforms, and stream channel stability

Figure F-10
Project Area Map with RHCAs



Project Specific RHCA Applications

In accordance with the Riparian Habitat Conservation Area Strategy, the interdisciplinary team has made the following project-level decisions in regard to stream and riparian protection:

1. Harvest units are configured to minimize effects on the identified RHCAs. No programmed timber harvest is scheduled within the RHCAs where riparian soils, fens, and MMI 4 soils are located immediately adjacent to the stream corridor.

2. Minimum buffers equal to the height of site-potential trees will be applied to all fish bearing streams. Site-potential tree-height buffers ensure that all potential large woody debris is available for recruitment into the stream.

3. Minimum 300 foot buffers will be implemented on anadromous habitat located in the mainstem of Carroll Creek (equal to or greater than the floodplain area).

4. The sediment delivery potential for each individual harvest unit will be analyzed to determine if buffers are required for Class III streams.

5. All proposed new and reconstructed road will be reviewed by the interdisciplinary team to evaluate its potential risk and prescribe site-specific road management objectives

Forest Plan Standards and Guidelines

The Revised TLMP Draft Revision (1996a) provides three options for stream and riparian protection. Option 3 implements current practices on the Tongass National Forest. Option 2 incorporates recommendations from the Anadromous Fisheries Habitat Assessment (AFHA 1995) and Option 1 directs the highest levels of protection.

The preferred alternative presented by the Forest Supervisors (April 8, 1996) designated that Option 2 Standards and Guidelines would be applied to Forest Habitat Integrity Plan 1 (FHIP 1) watersheds. Option 3, or current practices, would be applied to the remaining watersheds. FHIP status is assigned based on pink escapement, coho capability, and sport fish data. The list of FHIP 1 watersheds was cooperatively developed in 1979 by the Forest Service and the Alaska Department of Fish and Game (ADF&G). This list is currently under review.

At this time, VCUs 744 (Carroll Creek) and 737 (Neets Creek) are listed as FHIP 1 watersheds. For this reason, it is recommended that the Riparian Management Strategy be consistent with Option 2 of the proposed Standards and Guidelines. If a watershed-level analysis is conducted, Option 2 makes allowances for the use of site-specific prescriptions.

Riparian Management Areas

The National Forest Management Act (NFMA), Section 219.27 (12)(e), requires that riparian management areas (RMAs) be established to conserve soil and water resources and to prevent permanent impairment of the productivity of the land. Similar to RHCAs, RMAs are not zones of exclusion; rather, they are areas where topography, vegetation, soil, climatic conditions, management objectives, and other factors are to be considered in determining management practices and constraints. RMAs comprise the aquatic and riparian ecosystem, the adjacent floodplain, wetlands, and upland areas with potential to deliver sediment to channels.

RMAs have distinctive resource values and characteristics. Riparian vegetation is important in maintaining stream bank stability and floodplain integrity. Such vegetation slows water velocity on the floodplain while its roots inhibit erosion along stream and river banks. Riparian vegetation provides shade, leaf and needle litter which fuels aquatic food chains, and large woody debris (LWD), an important component of instream fish habitat.

Timber Harvest Considerations

Edges of harvest units, including riparian buffer strips, are prone to damage from winds. The direction that a buffer strip is oriented does not always determine whether the buffer will be prone to wind damage. The design of harvest units or road corridors located near or within the stream riparian zones should attempt to minimize blowdown risks and impacts. Where buffer edges of relatively tall trees occur along unit boundaries, innovative management techniques should be used to minimize blowdown risks to the riparian area.

Harvest along Class III mountain slope streams, where stream buffer windthrow and resulting destabilization of stream banks is a major concern, should be considered on a case-by-case basis. Large clearcuts and use of conventional yarding systems should not be allowed on sensitive soils in headwater source areas.

Stream Buffer Prescriptions

Specific buffer widths will be crafted for streams in the Project Area that are in compliance with the Forest Plan Revision (1979), Tongass Timber Reform Act (TTRA), and Best Management Practices (BMPs).

Current Forest-wide Standards and Guidelines assign buffer prescriptions to maintain the integrity and function of riparian areas. Based on stream class and channel type, prescriptions contain one or more of the following three components: no commercial, no programmed, and uneven-aged buffer widths (Tables F-6a, F-6b and F-6c). Ground verified information is also used to tailor effective, site-specific riparian prescriptions.

- Where the direction states "no commercial timber harvest", this is a standard and means that commercial timber harvest shall be prohibited (Tongass Timber Reform Act of 1990).

- Where the direction states "no programmed commercial timber harvest", no timber harvest will be scheduled, but unprogrammed commercial timber harvest could be allowed. Among other reasons, unprogrammed commercial timber harvest may include timber sold as part of salvage sale, for insect and disease abatement purposes, and for specialty wood products. Timber harvest would have to meet the objectives for the riparian area as determined by an analysis of site-specific conditions with an understanding of the watershed functions and stream channel processes.

- Uneven-age management prescriptions utilize both skyline and helicopter harvest methods to remove small group or individual tree selections and create a three storied stand. These methods maintain good growth, structural diversity, and the function of the original old growth forest.

- Site-potential tree height refers to the ability of a specific site to grow trees to a certain average height. Site-potential tree heights are identified to give zones of special management which are within or adjacent to a riparian area and ecological foundation. Since large wood recruitment to the aquatic ecosystem is a primary concern, the maximum average tree height is considered to be the greatest width of concern for large wood recruitment. Average maximum tree heights for each channel process group will be used to establish optimum buffer widths.

- The "implementation buffer width" represents the actual buffer width used for harvest unit layout procedure. The implementation buffer widths include areas designated for no commercial, no program, and uneven-aged management. At no time is the implementation buffer less than what is required by TTRA and Forest wide Standards and Guidelines (Figure F-11).

Table F-6a
Stream, Lake, and Estuarine Buffers for Class I and Class II TTRA Streams *

Channel Type	Planning Level RMA Width (ft.) [4]	No Commercial Harvest Width (ft.) [1]	No Programmed Harvest Width (ft.) [2]	Uneven-Aged Management Buffer Width (ft.) [3]	Site Potential Tree Height (ft.)	Implementation Buffer Width Width (ft.) [5]	Normal Occurrence[6]
Alluvial Fan							
AF1	100	100			140	140	Y
AF2	100	100			140	140	Y
Estuarine							
ES1	100	100	400		140	500	Y
ES2	100	100	100		140	200	Y
ES3	100	100	100		140	200	Y
ES4	100	100	400		140	500	Y
ES8	100	100	400		140	500	Y
Flood Plain							
FP1	150	100	100		130	200	Y
FP2	150	100	100		130	200	Y
FP3	100	100		100	130	200	Y
FP4	150	100	100		130	200	Y
FP5	150	100	100		130	200	Y
Highly Contained							
HC1	100	100			120	120	N
HC2	100	100			120	120	N
HC3	100	100			120	120	N
HC4	100	100			120	120	N
HC5	100	100			120	120	N
HC6	100	100			120	120	N
Large Contained							
LC1	100	100			100	100	Y
LC2	100	100			100	100	Y
Moderate Contained							
MC1	100	100			100	100	Y
MC2	100	100			100	100	Y
MC3	100	100			100	100	Y
Mixed Moderate							
MM1	100	100			120	120	Y
MM2	150	100			120	120	Y
Plaustrine							
PA1	100	100	100		100	200	Y
PA2	150	100	100		100	200	Y
PA3	100	100		400	100	500	Y
PA4	100	100		400	100	500	Y
PA5	100	100		400	100	500	Y
Lakes and Ponds							
Lakes > 50 acres	100	100		400	100	500	Y
Lakes >5 and <50	100	100		400	100	500	Y
Lakes < 5 acres	100	100		400	100	500	Y

2) No programmed commercial harvest allowed within this zone.
3) Only selective harvest or uneven-aged management will be allowed within this zone.
4) Represents the minimum riparian management area required for consideration under the Forest Plan.
5) Represents the project specific buffer width that will be used for the Upper Carroll EIS.
6) Denotes whether this channel type normally occurs in this stream classification.
* Buffer widths reflect horizontal distance extending from one side of the stream channel.

Table F-6b
Stream, Lake, and Estuarine Buffers for Non-TTRA Class II Streams *

Channel Type	Planning Level RMA Width (ft.) [4]	No Commercial Harvest Width (ft.) [1]	No Programmed Harvest Width (ft.) [2]	Partial Cut Buffer Width (ft.) [3]	Site Potential Tree Height (ft.)	Implementation Buffer Width Width (ft.) [5]	Normal Occurrence[6]
Alluvial Fan							
AF1	100	25		35	140	140	Y
AF2	100	25		35	140	140	Y
Estuarine							
ES1	100				140	140	N
ES2	100				140	140	N
ES3	100				140	140	N
ES4	100				140	140	N
ES8	100				140	140	N
Flood Plain							
FP1	150	25		35	130	130	N
FP2	150	25		35	130	130	N
FP3	100	25		35	130	130	N
FP4	150	25		35	130	130	N
FP5	150	25		35	130	130	N
Highly Contained							
HC1	100			100	120	120	N
HC2	100			100	120	120	N
HC3	100			100	120	120	N
HC4	100			100	120	120	N
HC5	100			100	120	120	N
HC6	100			100	120	120	N
Large Contained							
LC1	100		25		100	100	Y
LC2	100		25		100	100	Y
Moderate Contained							
MC1	100			100	100	100	Y
MC2	100			100	100	100	Y
MC3	100			100	100	100	Y
Mixed Moderate							
MM1	100			25	120	120	Y
MM2	150			60	120	120	Y
Plaustrine							
PA1	100		100		100	100	Y
PA2	150		100		100	100	Y
PA3	100			100	100	100	Y
PA4	100			100	100	100	Y
PA5	100			100	100	100	Y
Lakes and Ponds							
Lakes > 50 acres	100		100	400	100	500	Y
Lakes >5 and <50 acres	100			100	100	100	Y
Lakes < 5 acres	100				100	100	Y

1) No commercial harvest allowed within this zone.
2) No programmed commercial harvest allowed within this zone.
3) Only selective harvest or uneven-aged management will be allowed within this zone.
4) Represents the minimum riparian management area required for consideration under the Forest Plan.
5) Represents the project specific buffer width that will be used for the Upper Carroll EIS.
6) Denotes whether this channel type normally occurs in this stream classification.
* Buffer widths reflect horizontal distance extending from one side of the stream channel.

Table F-6c
Stream, Lake, and Estuarine Buffers for Class III Streams

Channel Type	Planning Level RMA Width (ft.) [4]	No Commercial Harvest Width (ft.) [1]	No Programmed Harvest Width (ft.) [2]	Partial Cut Buffer Width (ft.) [3]	Site Potential Tree Height (ft.)	Implementation Buffer Width Width (ft.) [5]	Normal Occurrence [6]
Alluvial Fan							
AF1	100		25		140	25	Y
AF2	100		25		140	25	Y
Estuarine							
ES1	100				140	0	N
ES2	100				140	0	N
ES3	100				140	0	N
ES4	100				140	0	N
ES8	100				140	0	N
						0	N
Flood Plain							
FP1	150		25		130	25	N
FP2	150		25		130	25	N
FP3	100		25		130	25	N
FP4	150		25		130	25	N
FP5	150		25		130	25	N
Highly Contained							
HC1	100				120	0	Y
HC2	100				120	0	Y
HC3	100				120	0	Y
HC4	100				120	0	Y
HC5	100				120	0	Y
HC6	100				120	0	Y
Large Contained							
LC1	100				100	0	N
LC2	100				100	0	N
Moderate Contained							
MC1	100				100	0	N
MC2	100				100	0	N
MC3	100				100	0	N
Mixed Moderate							
MM1	100			25	120	25	N
MM2	150			25	120	25	N
Plaustrine							
PA1	100				100	0	N
PA2	150				100	0	N
PA3	100				100	0	N
PA4	100				100	0	N
PA5	100				100	0	N
Lakes and Ponds							
Lakes > 50 acres	100			100	100	100	N
Lakes >5 and <50	100			100	100	100	N
Lakes < 5 acres	100				100	100	Y

1) No commercial harvest allowed within this zone.
2) No programmed commercial harvest allowed within this zone.
3) Only selective harvest or uneven-aged management will be allowed within this zone.
4) Represents the minimum riparian management area required for consideration under the Forest Plan.
5) Represents the project specific buffer width that will be used for the Upper Carroll EIS.
6) Denotes whether this channel type normally occurs in this stream classification.
* Buffer widths reflect horizontal distance extending from one side of the stream channel.

Figure F-11.
Map of Implementation Buffer, Adjacent Riparian Soils and Fens



Road Management Considerations

A fish stream is defined as any water flow that is accessible to fish and capable of supporting aquatic life. This includes, but is not limited to, all ADF&G designated streams and all their tributaries up to impassable natural barriers. Freshwater systems above blockages may also support resident fish stocks. Evaluation and recommendations will be made by a Fisheries Biologist during route locations to determine the presence of fish/fish habitat.

The objective of providing fish passage is to not interrupt the natural migration of anadromous and resident salmonids. Fish populations depend upon a mixture of habitat types for growth and reproduction. The incorporation of fish passage facilities at stream crossings should be based on assessments of the life cycle requirements of fish species, of habitat quality, and the accessibility of sites to fish.

The choice of crossing location is very important in terms of both sedimentation effects and fish passage. Stream reaches with uniform alignment, good bank stability, and uniform gentle gradients are the easiest to cross with provisions for fish passage.

Guidelines in the Aquatic Habitat Management Handbook (AHMU) recommend that fish passage be provided on all streams with natural gradients of 4% or less using typical designs for bridges and culverts installed at a grade of 1% or less. Streams with gradients greater than 4% are evaluated by Fisheries Biologists on a site-specific basis.

The seasonal timing of instream construction operations are most often prescribed as a resource protection requirement for Class I streams. Timing may be recommended on Class II and sometimes Class III streams. Timing recommendations are based on the site-specific and downstream impacts to: spawning, egg presence, fry emergence, and migration of smolts (BMP 14.64). Table F-7 displays the general timing windows for instream construction.

Table F-7
Timing Windows for Instream Construction

Species	Timing Window
Pink/Chum	June 1 to August 7
Sockeye	July 18 to August 15
Coho	June 15 to September 1
Steelhead	July 18 to August 15

The dates for the general windows represent a period during which instream work can be conducted. For example, if pink salmon are present, all instream work must be done between June 1 and August 7. However, if both pink salmon and steelhead are present, the timing window is shortened to July 18 to August 7.

Final timing and construction windows are to be determined from a review of site and stream specific information. Variances from the general windows are allowed on a case by case basis, particularly with implementation of the appropriate mitigation measures as prescribed by fisheries biologists.

Additional recommendations for design and maintenance of the road system to maintain riparian and wetland function and fish habitat include:

- With the project area, avoid or minimize the amount of new road construction through fens. Roads located on fens can impede the natural water movement associated with these areas and generally require a high density of drainage structures. Fens often contain numerous Class I and II channels that provide high value fish habitat and will therefore require special passage and/or timing restrictions. Roads located within fens usually require high maintenance due to beaver activity.

- Avoid crossing active alluvial fan channel areas. Where possible locate crossings at the apex of the fan where the stream is still relatively contained. If the fan must be crossed, oversized and extra drainage structures are recommended.

- Remove all drainage structures in sensitive areas where fish passage, beaver habits, and unstable stream channels are a concern unless routine road drainage maintenance is feasible. Close all temporary roads and use water bars to control road drainage.

- Construction of roads, particularly mid-slope roads, in sediment source areas should be avoided. Roads in these sensitive areas have potential for accelerating large scale mass wasting and have a high likelihood of direct sediment delivery to anadromous and resident fish habitats.

Anadromous Fisheries Habitat Assessment Recommendations

The Upper Carroll project implements the recommendations applicable to project-level planning presented in the Anadromous Fish Habitat Assessment (AFHA) report of January 1995. Examples of implementing these recommendations include the following.

- Classification of streams draining intermittent and ephemeral channels will apply to the project area as outlined by the Regional Forester in a letter dated November 21, 1996. The letter provides a definition of TTRA language of "...flows directly into...", clarifies stream class definitions of Class I, II, III and adds new Class IV and non-stream categories.

- Fish habitats and communities were inventoried and characterized with the Region 10 Basin Wide Survey Protocol (1994). The ground verified data was incorporated into the Geographic Information System (GIS) and used for project-level planning.

- During filed reconnaissance, areas with steep slopes, high hazard soils, and Class III streams were identified and evaluate for risk of adverse impacts on headwater channels. BMPs listed on the individual unit and road cards are prescribed to reduce the risk of on-site erosion and delivery of sediment to a stream channel.

- Watershed-level analyses are provided for the Neets Bay and Carroll Creek watersheds. Additional site-specific analysis is used to address the potential delivery of sediment from Class III to Class I and II streams. The intent of this site-specific analysis is to determine where increased protection of headwater areas is required to deter long-term, downstream impacts to fish habitat.

- Site-specific stream side buffers are provided for floodplain and confined alluvial channels. Harvest units adjacent to Class I and Class II stream channels were investigated by project fisheries biologists to determine the extent and type of buffer necessary to assure protection of any small, off-channel streams associated with floodplains and to provide a long term source of woody debris. After further analysis,

some stream side buffers have been enlarged to encompass adjacent riparian soils and fens.

- Increased monitoring on implementation and effectiveness of procedures for anadromous fish habitat are addressed later in this document. These procedures include: cross-sectional transects established in Carroll Creek to monitor changes in channel morphology over time, thermographs installed to monitor stream temperature and plans to conduct road condition surveys 2, 5 and 10 years after road construction to identify maintenance concerns.

The remaining 8 recommendations are beyond the scope of this project and are being addressed in the TLMP Revision (1996) or by the Tongass Forest Supervisors and the Regional Director of Wildlife, Fisheries, Ecology, and Watershed.

Proposed Management Activities

The USDA Forest Service proposes to harvest up to approximately 70 million board feet of timber in the Upper Carroll Project Area, Ketchikan Ranger District, Ketchikan Administrative Area, Tongass National Forest. Timber volume will be offered to the Ketchikan Pulp Company (KPC) under the Long-term Timber Sale Contract and/or the Ketchikan Area independent timber sale program. The actions analyzed in the EIS are designed to implement direction contained in the Tongass Land Management Plan (TLMP, 1979a, as amended) and the Tongass Timber Reform Act. It is also our intent to demonstrate consistency with the standards and guidelines in the TLMP Revision (1996).

The EIS describes six alternatives which provide different combinations of resource outputs and spatial locations of harvest units. The remainder of this section includes a discussion of the alternatives and their associated harvest units.

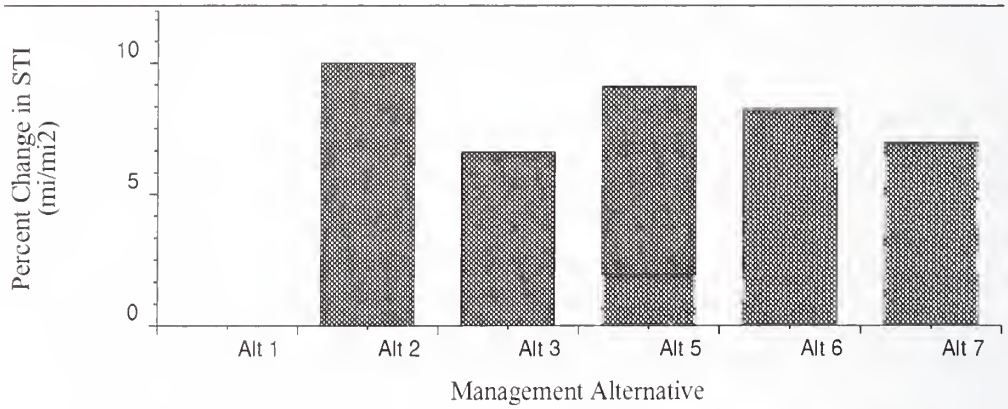
Carroll Creek Watershed

Alternative Analysis

The Sediment Transport and Depositions Analysis suggests that management activity in sub-basins S4 and S5 have the highest potential for adversely affecting fish habitat. Total STI scores for sub-basins S4 and S5 are shown in Figure F-3.

To determine the relative risk of each alternative, cumulative STI scores were evaluated (Figure F-12). Alternative 1 is the "no action" alternative and represents a baseline score. The highest total scores are seen for Alternatives 2, 5, and 6, which are the only alternatives with harvest and road-building activities in sub-basin S5. Management activities in sub-basin S4 are relatively constant over all alternatives, with the exception of Alternatives 6 and 7. Alternatives 2,5, 6, and 7 represent the highest risk in terms of sediment production, transport, and deposition, while Alternative 3 represents the lowest risk.

Figure F -12
Cumulative STI Scores by Alternative



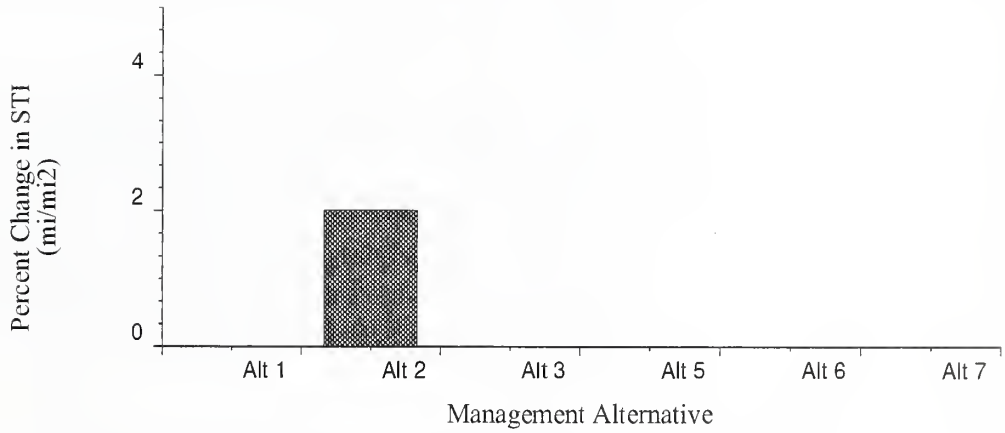
Other areas within the watershed are not as great of a management concern. Sub-basin S6 has no programmed harvest in any alternative. Harvest and road-building activities in sub-basin S7 are projected to have minimal impact for all alternatives because 1) it is the second smallest sub-basin in the watershed (806 acres) with a low discharge and stream capacity, 2) it has only minimal amount of high mass movement potential soils (< 5%), and 3) hillslope streams in sub-basin S7 flow directly into a large muskeg complex which acts as a buffer to mainstem fish habitat. Potential sediment impacts from management activities in sub-basins S8 and S9 are also projected to be minimal because 1) they have minimal levels of harvest, and 2) they enter the mainstem low in the watershed downstream of high complexity fish habitat.

Cumulative SDI scores for each management alternative are not presented because they are not particularly meaningful. The primary concern from management activities is the mobilization of excess sediment in upslope areas and its subsequent transport and deposition downstream. A high SDI index identifies low-gradient areas where sediment is likely to be deposited, but impacts in high SDI areas are primarily a consequence of activities in upslope areas with a high transport index (STI). Consequently, cumulative SDI scores are not reported.

Neets Bay

Alternatives 2 and 5 for the Upper Carroll Project Area propose management activities in the Neets Bay Watershed. Of these activities, potential slope failures associated with roads in reach R1 present the highest sediment risk. Cumulative STI scores for each alternative are shown in Figure F-13. Alternative 1 is the "no action" alternative and represents a baseline score. The highest total score is seen for Alternative 2, which represents the highest risk in terms of sediment production, transport, and deposition.

Figure F -13
Cumulative STI scores by Alt for Neets.



As discussed earlier, total SDI scores are not presented because they are not particularly applicable for assessing sediment risk.

F Appendix

Harvest Unit Analysis

In order to conduct site-specific harvest unit analysis, additional modeling work was used in conjunction with the Sediment Deposition and Transition Analysis procedure. The Sediment Delivery Potential Index (SDPI) developed for use on this project, quantitatively utilizes morphologic features to evaluate proposed harvest units. The SDPI provides a relative rating (on a scale from 0 to 10) and serves as another tool for identifying key areas in the watershed. The model components are as follows:

Unit area (A_h)
Unit slope (S_h)
Number of streams within harvest unit ($S_\#$)
Distance to Class I or Class II fish habitat (D_{fh})
Relief from unit to fish habitat (R_h)
Sub-basin Sediment Deposition Index rating (SDI)

These quantitative measurements obtained from the Ketchikan Area GIS database are used to determine the Export Capability Factor ($S_h * S_\#$) and the Delivery Capability Factor (R_h / D_{fh}). These components are multiplied by the Area Factor (A_h) and the SDI rating for the particular sub-basin where the harvest unit is located. The SDI component broadens the scope of the analysis to the watershed level. The initial SDI ratings are scaled by assigning the highest score in the watershed a "10". A SPDI rating of 0.0 is the result of the analysis being scaled to all the values generated in the watershed. However, this does not mean a harvest unit with 0.0 SDPI rating will be disregarded.

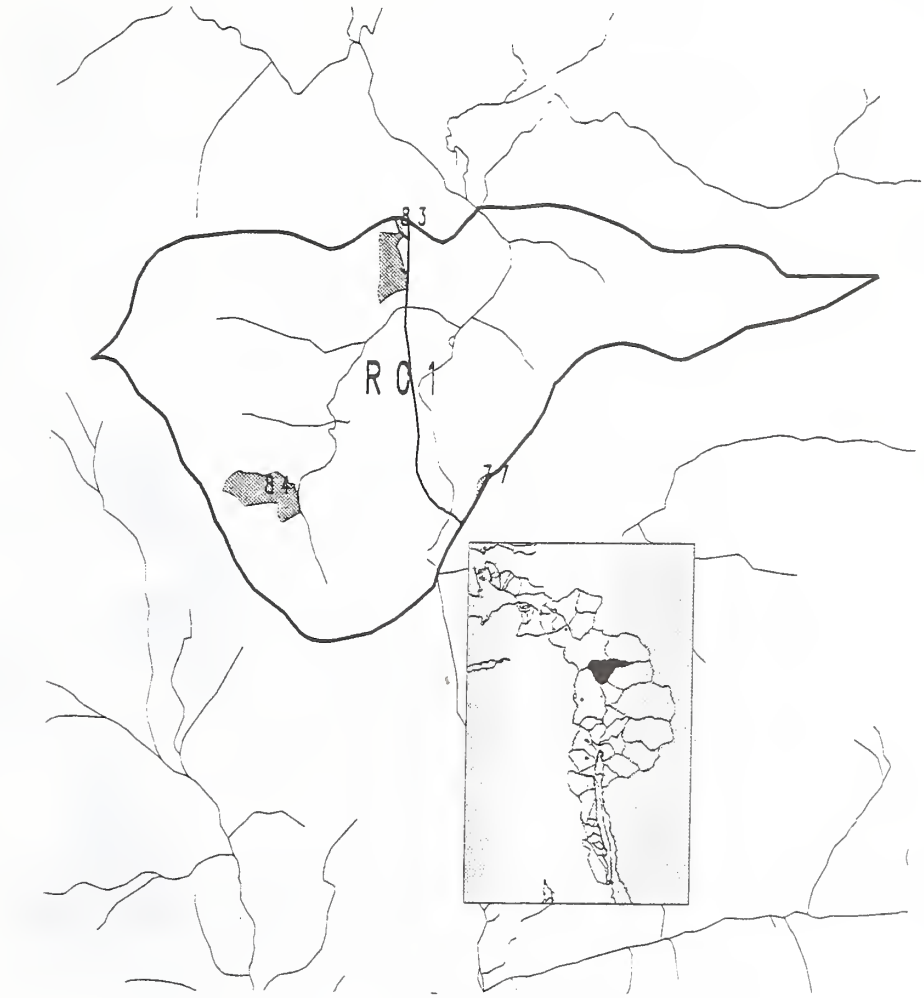
The SDPI tool is intended to highlight harvest units that may require additional consideration. This information will then be coupled with field observations to provide effective, site-specific stream and riparian prescriptions.

Temperature-Sensitive Streams

All watersheds within the Project Area meet the TLMP Draft Revision (1991a) Standards and Guidelines for temperature sensitivity by limiting harvest to 35 percent of the watershed land base within a 15-year period.

The Ketchikan Area GIS Database was used to identify harvest units with the following temperature-sensitive characteristics: south-facing slopes, lack of immediate downstream forested stream buffers, historical and continued harvest activities, shallowness, flow, adjacency to ponds or muskegs, and fish production (FSH 2609.24 Appendix 4). This initial exercise identified units 4, 5, 16, 19, 57 and 93 as having the potential to influence stream temperatures. Field reconnaissance was then conducted to ground verify these concerns and prescribe appropriate mitigation where necessary. After field review, temperature sensitivity concerns were only validated for Unit 16. Sideslope of partial-cut buffers on significant water quality streams are recommended to mitigate the effects of timber harvest on stream temperature for this unit.

Figure F-12
Carroll Creek Reach 1



Carroll Creek Reach 1

Unit 83

Unit 83 is a 24-acre clearcut located on the divide between reach R1 and sub-basin S1. Approximately 16 acres is included in reach R1. The SDPI rating for this harvest unit is 0.0.

- Class II FP5 stream south (TTRA): 200 foot buffer (BMP 12.6 & 12.6a) .

Unit 84

Unit 84 is a 21-acre clearcut bordered by a Class III water quality stream. The SDPI rating for this harvest unit is 0.0.

- Class III HC6 stream east: sideslope buffer (BMP 12.6 & 12.6a) .

Figure F-13
Carroll Creek Reach 2



Carroll Creek Reach 2

Unit 67

Unit 67 is a 40 acre clearcut bordered by two resident fish streams with a water quality tributary extending into the unit. The SDPI rating for this harvest unit is 1.2 and reflects the unit's close proximity to fish habitat. Class III MC2 stream is not field verified and will require examination during layout. Recommend deleting southwest corner of unit to ensure split yarding or full suspension requirements are feasible.

- Class II MC2 stream northwest (TTRA): 100 foot buffer (BMP 12.6 & 12.6a)
- Class II MC2 stream southwest (TTRA): 100 foot buffer (BMP 12.6 & 12.6a)
- Class III MC2 stream southcentral: split yarding or full suspension required (BMP 13.9)

Unit 68

Unit 6 is a 4.2 acre clearcut adjacent to two resident fish streams. The SDPI rating for this harvest unit is 0.8 and reflects the close proximity to fish habitat.

- Class II HC3 stream south (TTRA): 100 foot buffer (BMP 12.6 & 12.6a)
- Class II MC2 stream west (TTRA): 100 foot buffer (BMP 12.6 & 12.6a)

Unit 70

Unit 70 is a 46 acre clearcut adjacent to a water quality stream. The SDPI rating for this harvest unit is 0.6, elevated by the unit's slope and relief ratio. Recommended cable yarding techniques are re-evaluated for this unit (primarily northern setting).

- Class III HC4 stream north (TTRA): sideslope buffer (BMP 12.6 & 12.6a)

Unit 71

Unit 71 is a 27 acre clearcut bordered by two water quality and one resident fish stream. Class III MC2 stream is not field verified and will require further examination during layout. The SDPI rating for this harvest unit is 0.0.

- Class II MC2 stream south (TTRA): 100 foot buffer (BMP 12.6 & 12.6a)
- Class III MC2 stream south: sideslope buffer (BMP 12.6 & 12.6a)
- Class III HC4 stream east: sideslope buffer (BMP 12.6 & 12.6a)

Unit 72

Unit 72 is a 31 acre clearcut bordered by the mainstem (west) and an intervening segment of Class III. The close proximity of fish habitat provides a 0.6 SDPI rating for this harvest unit. Recommend deleting northwest tip of unit closest to the mainstem.

- Class II MC3 stream west (TTRA): 100 foot buffer (BMP 12.6 & 12.6a)
- Class III HC3 stream north: sideslope buffer (BMP 12.6 & 12.6a)

Unit 73

Unit 73 is a 39 acre clearcut split by the sub-basin/reach boundary with sub-basin S03 (15 acres are located within reach R2). The harvest unit is bordered by two resident fish streams. The presence of an intervening segment of Class III downstream of the FP3 stream reach is not considered TTRA. The SDPI rating for this harvest unit is 0.2. Recommend trimming unit boundary to accommodate for appropriate buffers.

- Class II MC2 stream north (TTRA): 100 foot buffer (BMP 12.6 & 12.6a)
- Class II FP3 stream west: 130 foot buffer (BMP 12.6 & 12.6a)

Figure F-14
Carroll Creek Reach 3



Carroll Creek Reach 3

Unit 4

Unit 4 is an 81 acre clearcut split by the sub-basin/reach boundary with sub-basin S05 (21 acres are located within reach R3). The harvest unit is bordered by the mainstem (east) the west fork (south) and surrounds several other fish streams. The MM2 stream reaches located in the northeast corner of the unit are well developed alluvial channels. Settings 1 and 2 should be reviewed prior to implementation. Recommend trimming unit boundary to apply additional stream buffers. The SDPI ratings for this harvest unit are 0.2 and 2.3 for reach R3 and sub-basin S5 respectively. Although this unit was previously identified as temperature sensitive, field review has determined additional mitigation will not be required.

- Class I FP5 stream reach east (TTRA): 300 foot buffer (BMP 12.6 & 12.6a)
- Class I LC2 stream reach east (TTRA): 100 foot buffer (BMP 12.6 & 12.6a)
- Class I FP4 stream south (TTRA): 260 foot buffer (BMP 12.6 & 12.6a)
- Class II HC2 streams southwest (TTRA): 120 foot buffer (BMP 12.6 & 12.6a)
- Class II MM2 stream southwest (TTRA): 100 foot buffer (BMP 12.6 & 12.6a)
- Class II MM2 streams northwest (TTRA): 200 foot buffer (BMP 12.6 & 12.6a)

Unit 5

Unit 5 is an 81 acre clearcut split by the sub-basin/reach boundary with sub-basin S05 (10 acres are located within reach R3). The harvest unit contains two water quality streams and is bordered by the mainstem (east) and a water quality to the northwest. Special consideration should be given to settings 3 and 4. Recommend relocation of the road to minimize the number of stream crossings and/or passage requirements. The SDPI ratings for this harvest unit are 0.3 and 2.4 for reach R3 and sub-basin S5 respectively. Although this unit was previously identified as temperature sensitive, field review has determined additional mitigation will not be required.

- Class I LC2 stream reach east (TTRA): 100 foot buffer (BMP 12.6 & 12.6a)
- Class III HC5 stream northwest: foot sideslope buffer (BMP 12.6 & 12.6a)
- Class III HC2 and HC3 streams north: split yarding or full suspension (BMP 13.9)

Unit 8

Unit 8 is a 72 acre clearcut split by the sub-basin/reach boundary with reach R4 and sub-basin S7 (44 acres are located within reach R3, 6 acres in reach R4, and 42 acres in sub-basin S7). The harvest unit contains three water quality streams and is bordered by one to the south. The southwestern unit boundary is adjacent to the mainstem floodplain. Recommend deleting the portions of settings 1 and 3 west of proposed road. The SDPI ratings for this harvest unit are 0.8 (R3), 0.0 (R4), and 0.6 (R7).

- Class I FP5 stream southwest (TTRA): 300 foot buffer (BMP 12.6 & 12.6a)
- Class III HC5 streams northwest: split yarding or full suspension (BMP 13.9)
- Class III HC6 stream southeast: sideslope buffer (BMP 12.6 & 12.6a)

Unit 53

Unit 53 is a 31 acre clearcut located high on the ridge in reach R3 and has a SDPI rating of 0.6. Although this unit is not in close proximity to fish habitat, extensive midslope roading is required to access the timber. Recommend a review of logging systems prescribed for this unit.

Unit 56

Unit 56 is a 20 acre clearcut that contains several water quality streams and is adjacent to high quality fish habitat. Recommend trimming unit boundary to avoid riparian soils and adjacent fens and to apply additional stream buffers. The SDPI rating for this harvest unit is 0.2.

- Class I FP5 stream west (TTRA): 300 foot buffer (BMP 12.6 & 12.6a)
- Class III HC4 streams central: split yarding or full suspension (BMP 13.9)
- Class III HC5 stream north: sideslope buffer (BMP 12.6 & 12.6a)

Unit 57

Unit 57 is a 37 acre clearcut bordered. This unit contains two water quality streams lying parallel to the highly contained reach of the mainstem. The unit is also adjacent to a FP3 stream reach (south). The high relief value and proximity to fish habitat produced a 5.5 SDPI rating. Recommend dropping southern tip of unit and maintaining a windfirm buffer. Although this unit was previously identified as temperature sensitive, field review has determined additional mitigation will not be required.

- Class II LC2 stream west (TTRA): sideslope plus 100 foot extended buffer (BMP 12.6a)
- Class I FP3 stream south (TTRA): 260 foot buffer (BMP 12.6 & 12.6a)
- Class III HC5 streams west-central: split yarding or full suspension (BMP 13.9)
- Class III HC5 streams west-central: split yarding or full suspension (BMP 13.9)

Unit 58

Unit 58 is an 18 acre clearcut containing one water quality stream. Recent field observations revealed that the stream is not classified correctly. The presence of fish has been documented immediately downstream from the unit and further inspection is required. Recommend this stream is buffered to prevent additional changes during implementation. The SDPI rating for this harvest unit is 0.7.

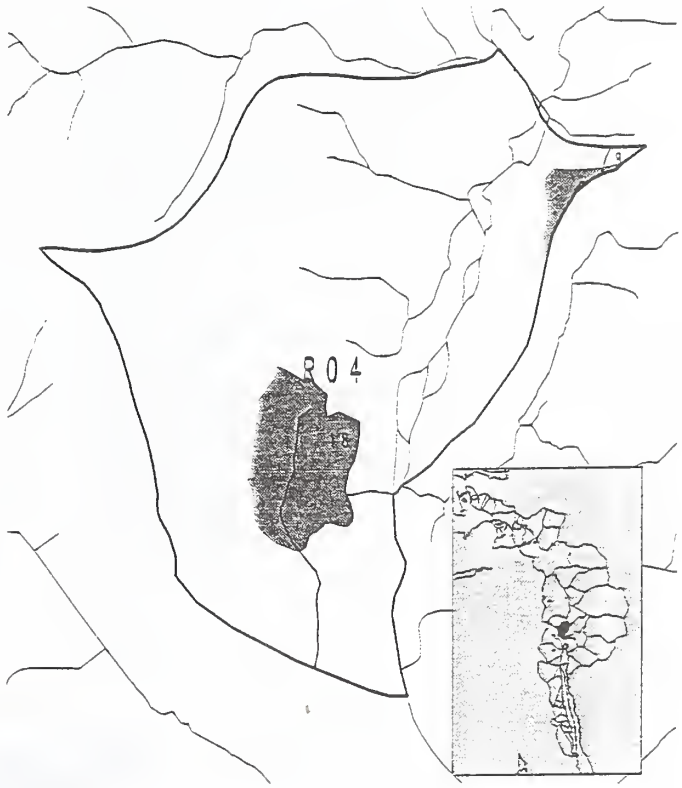
- Class II/III stream south (TTRA): 120 foot buffer, split yarding or full suspension (BMP 13.9) (BMP 12.6 & 12.6a)
- Class III HC6 stream north: sideslope buffer (BMP 12.6 & 12.6a)

Unit 59

Unit 59 is a 41 acre clearcut containing two water quality streams, bordered by the mainstem to the west and a large tributary to the north. This mainstem reach is moderately incised with higher gradients in the lower section. Recommend adjusting western unit boundary to accommodate a larger stream buffer. Proximity to fish habitat and the number of streams within the unit result in a 1.9 SDPI rating. Buffering water quality streams located within the unit should receive consideration.

- Class II MC3 stream west (TTRA): slope break plus 100 foot buffer (BMP 12.6 & 12.6a)
- Class II MM1 stream north (TTRA): 200 foot buffer (BMP 12.6 & 12.6a)
- Class III HC5 stream south: sideslope buffer (BMP 12.6 & 12.6a). or split yarding or full suspension (BMP 13.9)
- Class III HC6 stream north: sideslope buffer (BMP 12.6 & 12.6a), or split yarding or full suspension (BMP 13.9)

Figure F-15
Carroll Creek Reach 4



Carroll Creek Reach 4

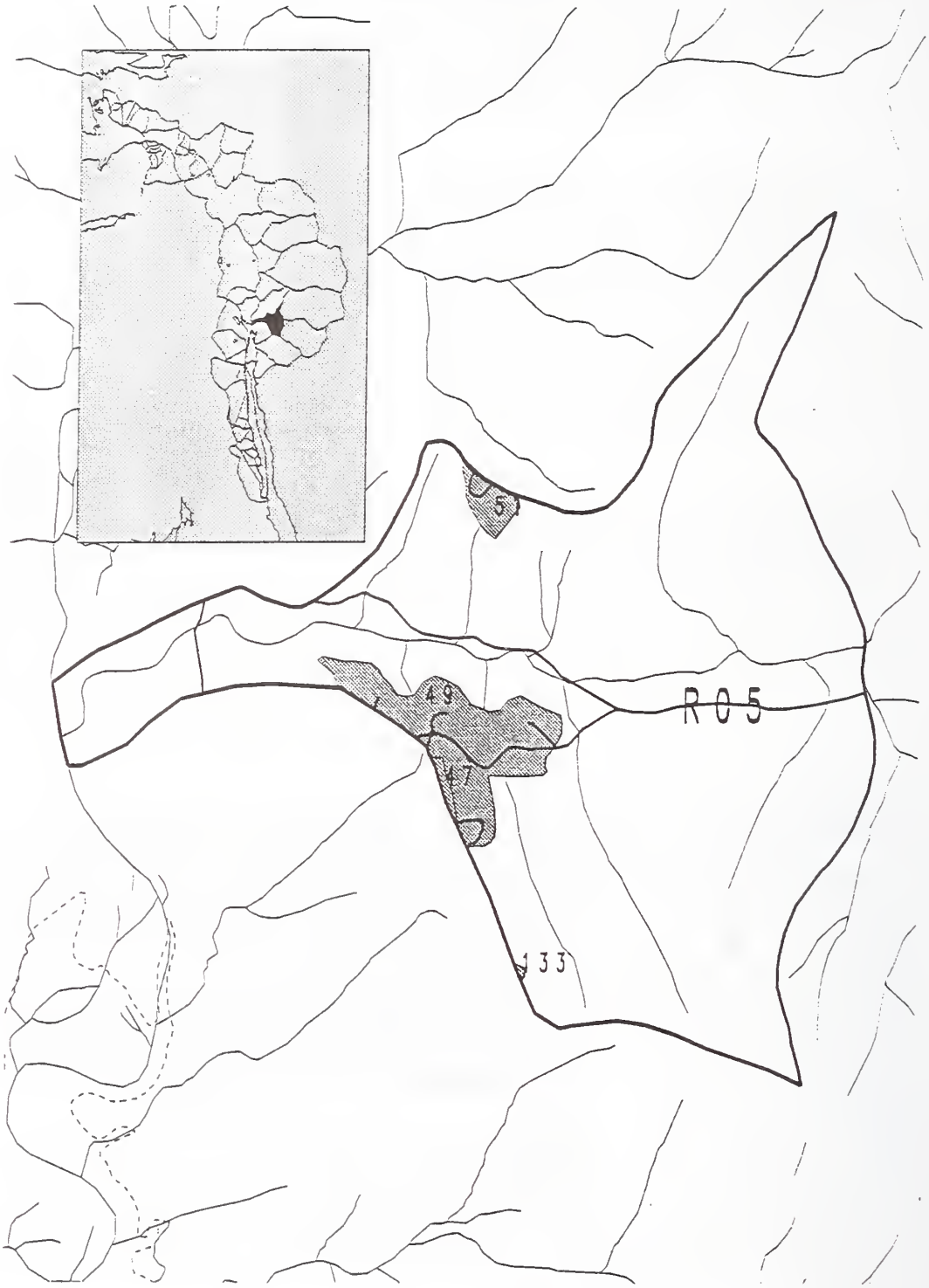
Unit 8
Unit 8 is a 72 acre clearcut split by the sub-basin/reach boundary with reach R4 and sub-basin S7 (44 acres are located within reach R3, 6 acres in reach R4, and 42 acres in sub-basin S7). The harvest unit contains three water quality streams and is bordered by one to the south. The southwestern unit boundary is adjacent to the mainstem floodplain. Recommend deleting the portions of settings 1 and 3 west of proposed road. The SDPI ratings for this harvest unit are 0.8 (R3), 0.0 (R4), and 0.6 (R7).

- Class I FP5 stream southwest (TTRA): 300 foot buffer (BMP 12.6 & 12.6a)
- Class III HC5 streams northwest: split yarding or full suspension (BMP 13.9)
- Class III HC4 stream west: split yarding or full suspension (BMP 13.9)
- Class III HC5 stream south: sideslope buffer (BMP 13.9)

Unit 18
Unit 18 is a 43 acre clearcut on moderate slopes containing one water quality stream. The SDPI rating for this harvest unit is 0.3. Recommend re-evaluating road accessing the harvest unit.

- Class III HC6 stream south: split yarding or full suspension (BMP 13.9)

Figure F-16
Carroll Creek Reach 5



Carroll Creek Reach 5

Unit 49

Unit 49 is a 47 acre clearcut split by the reach boundary with reach R6 (54 acres are located within reach R5). The harvest unit contains two water quality streams and is bordered by one to the east. The northern unit boundary is adjacent to the main tributary channel. Recommend altering northern unit boundary to buffer lower reaches of water quality streams. The SDPI ratings for this harvest unit are 5.0 (R5) and 0.0 (R6).

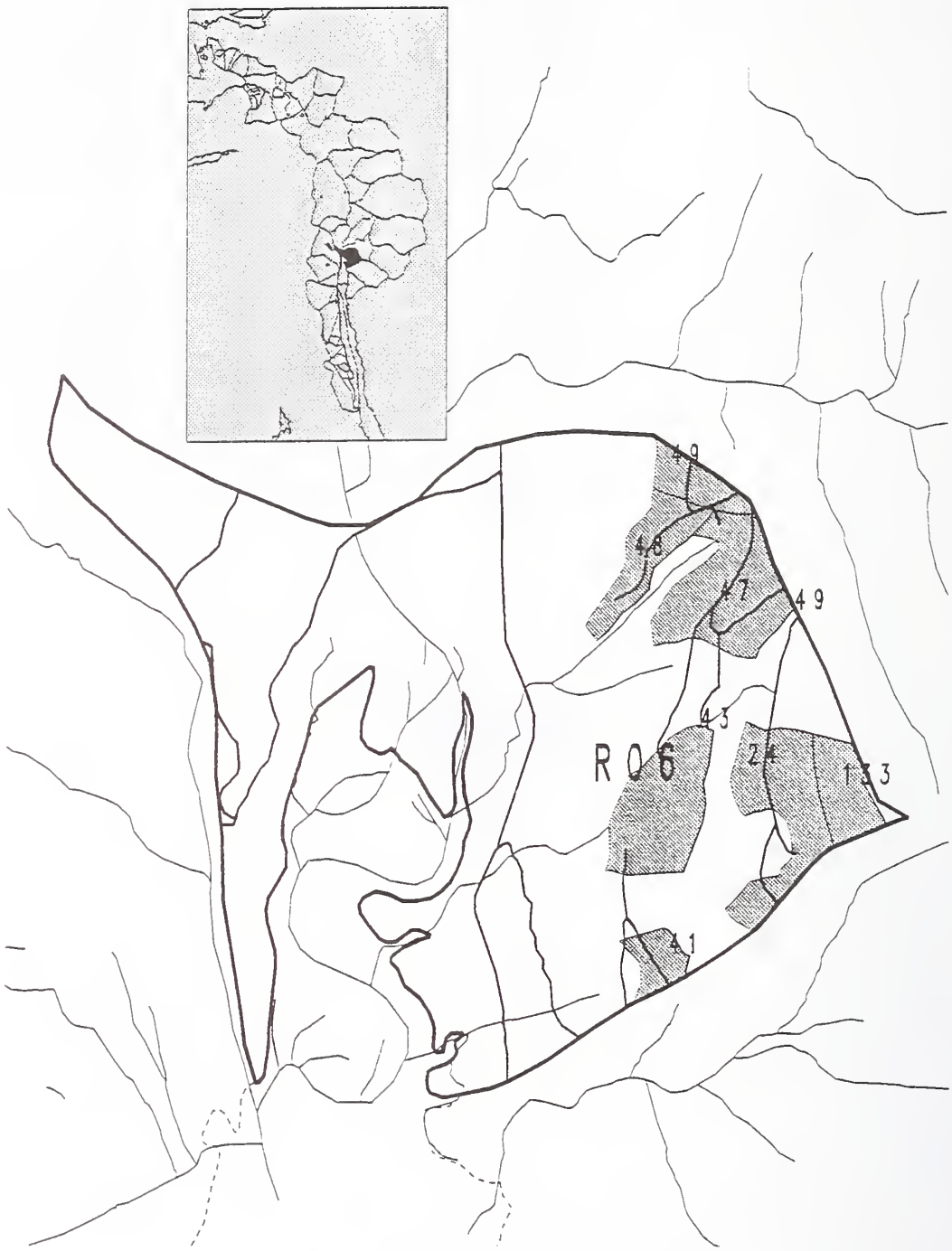
- Class I MM1/MM2 stream north (TTRA): 300 foot buffer (BMP 12.6 & 12.6a)
- Class III HC5 stream west: split yarding or full suspension (BMP 13.9)
- Class III HC6 stream east: split yarding or full suspension (BMP 13.9)
- Class III HC5 stream east (borders unit): sideslope buffer (BMP 13.9)

Unit 51

Unit 51 is a 32 acre clearcut split by the sub-basin/reach boundary with sub-basin S7 (7 acres are located within reach R5). The harvest unit contains two water quality streams. The SDPI ratings for this harvest unit are 0.1 (R5) and 0.6 (S7). Recommend deleting southern tip of unit that includes water quality stream and re-evaluate logging systems in the western corner.

- Class III HC5 stream south: sideslope buffer (BMP 13.9) or exclusion from unit
- Class III HC5 stream west: split yarding or full suspension (BMP 13.9)

Figure F-17
Carroll Creek Reach 6



Carroll Creek Reach 6

Unit 24
Unit 24 has 21 acres of clearcut scheduled in reach R6. The harvest unit is bordered by one water quality stream to the east. The SDPI rating for this harvest unit is 0.1.

- Class III HC5 stream east: sideslope buffer (BMP 13.9)

Unit 41
Unit 41 has 21 acres of clearcut scheduled in reach R6. The harvest unit contains one water quality stream and is adjacent to the estuary buffer. The SDPI rating for this harvest unit is 0.0.

- Class III HC6 stream east: split yarding or full suspension (BMP 13.9)

Unit 43
Unit 43 has 32 acres of clearcut scheduled in reach R6. The harvest unit contains one water quality stream and is adjacent to the estuary buffer. Due to stream location and incision, a sideslope buffer may be implemented during harvest unit layout. The SDPI rating for this harvest unit is 0.2.

- Class III HC5 stream north: split yarding or full suspension (BMP 13.9)

Unit 45
Unit 45 is a 17 acre harvest unit that contains two water quality streams. The SDPI rating for this harvest unit is 0.2.

- Class III HC2 stream north: split yarding or full suspension (BMP 13.9)
- Class III HC5 stream southeast: split yarding or full suspension (BMP 13.9)

Unit 47
Unit 47 is a 24 acre harvest unit that contains one water quality stream. Recommend buffering the deeply incised stream reach adjacent to unit boundary. The SDPI rating for this harvest unit is 0.1. Recommend sideslope buffer on deeply incised reach of stream.

- Class III HC6 stream southern reach: 100 foot sideslope buffer (BMP 12.6a)
- Class III HC6 stream northern reach: split yarding or full suspension (BMP 13.9)

Unit 48
Unit 48 has 12 acres of clearcut scheduled in reach R6. Recommend buffering the deeply incised stream reach adjacent to unit boundary. The SDPI rating for this harvest unit is 0.1.

- Class III HC6 stream east: 100 foot sideslope buffer (BMP 13.9)

Unit 49
Unit 49 is a 47 acre clearcut split by the reach boundary with reach R6 (54 acres are located within reach R5). The harvest unit contains two water quality streams and is bordered by one to the east. The northern unit boundary is adjacent to the main tributary channel. Recommend altering northern unit boundary to buffer lower reaches of water quality streams. The SDPI ratings for this harvest unit are 5.0 (R5) and 0.0 (R6).

- Class I MM1/MM2 stream north (TTRA): 300 foot buffer (BMP 12.6 & 12.6a)
- Class III HC5 stream west: split yarding or full suspension (BMP 13.9)
- Class III HC6 stream east: split yarding or full suspension (BMP 13.9)
- Class III HC5 stream east (borders unit): sideslope buffer (BMP 13.9)

Unit 133
Unit 133 has 9 acres of helicopter-yarded clearcut scheduled in reach R6. The SDPI rating for this harvest unit is 0.2. Streams have not been identified within this unit.

Figure F-18
Carroll Creek Sub-basin 1



Carroll Creek Sub-basin 1

Unit 15
Unit 15 has been dropped from the unit pool.

Unit 76
Unit 76 is a 25 acre clearcut split by the sub-basin boundary with sub-basin S2 (22 acres are located within sub-basin S1). The harvest unit is bordered by a fish-bearing, alluvial channel. The gentle slope of the unit and the absence of water quality streams results in low SDPI ratings for this harvest unit (0.0 and 0.1).

- Class II MM2 stream west (TTRA): 120 foot buffer (BMP 12.6 & 12.6a)

Unit 79
Unit 79 is a 27 acre clearcut bordered by a resident fish stream and two water quality streams. The SDPI rating for this harvest unit is 0.5.

- Class II MM2 stream west (TTRA): 120 foot buffer (BMP 12.6 & 12.6a)
- Class III HC5 stream northeast: sideslope buffer (BMP 12.6 & 12.6a) (BMP 13.9)
- Class III AF2 stream west: sideslope buffer (BMP 12.6 & 12.6a)

Unit 80
Unit 80 is a 28 acre clearcut. SDPI rating is 0.3.

- Class III HC6 stream north: sideslope cut buffer (BMP 12.6 & 12.6a)

Unit 81
Unit 81 is a 29 acre clearcut. SDPI rating for this unit is 0.1. There are no fisheries or watershed concerns with this unit.

Unit 82
Unit 82 is a 19.4 acre clearcut. SDPI rating for this unit is 0.1. The harvest unit is comprised of two settings split by an alluvial fan channel. The unit is also bordered by a fish bearing floodplain channel to the north.

- Class II FP3 stream northwest (TTRA): 200 foot buffer (BMP 12.6 & 12.6a)
- Class II MC1 stream northeast (TTRA): 100 foot buffer (BMP 12.6 & 12.6a)
- Class III AF1 stream central: 140 foot variable buffer (BMP 12.6 & 12.6a)

Unit 83
Unit 83 is a 24 acre clearcut located on the divide between reach R1 and sub-basin S1. Approximately 16 acres is included in reach R1. The SDPI rating for this harvest unit is 0.2.

- Class II FP5 stream south (TTRA): 260 foot buffer (BMP 12.6 & 12.6a)

Unit 129
Unit 129 is 25 acre clearcut. SDPI is 0.0. There are no fisheries or watershed concerns with this unit.

Figure F-19
Carroll Creek Sub-basin 2



Carroll Creek Sub-basin 2

Unit 75

Unit 75 is an 11 acre clearcut. SDPI is 0.0. There are no fisheries or watershed concerns with this unit.

Unit 76

Unit 76 is a 25 acre clearcut split by the sub-basin boundary with sub-basin S2 (22 acres are located within sub-basin S1). The harvest unit is bordered by a fish-bearing, alluvial channel. The gentle slope of the unit and the absence of water quality streams results in low SDPI ratings for this harvest unit (0.0 and 0.1).

- Class II MM2 stream west (TTRA): 120 foot buffer (BMP 12.6 & 12.6a)

Unit 129

Unit 129 is a 25 acre clearcut. SDPI is 0.0. There are no fisheries or watershed concerns with this unit.

Figure F- 20
Carroll Creek Sub-basin 3



Carroll Creek Sub-basin 3

Unit 73

Unit 73 is a 39 acre clearcut, 24 of which falls within sub-watershed 3. This unit is adjacent to one resident fish bearing stream. The SDPI rating for this unit is 0.2 and reflects close proximity to class II fish habitat.

- Class II FP5 stream west central (AHMU): 130 foot buffer (BMP 12.6 & 12.6a)

Units 74 and 75

Units 74 and 75 are small units with SDPI ratings of 0.0. There are no fisheries or watershed concerns with either unit.

Unit 130

Unit 130 is a 25 acre clearcut that is adjacent to and containing one resident fish stream and two water quality streams. The SDPI rating for this unit is 0.2 and reflects close proximity to class II fish habitat.

- Class II MC2 stream northwest (TTRA): 100 foot buffer (BMP 12.6 & 12.6a)
- Class III AF1 stream northeast: variable buffer (BMP 12.6 & 12.6a)
- Class III HC6 stream central: split yarding and full suspension required (BMP 13.9)

Unit 131

Unit 131 is a 36 acre clearcut. SDPI rating is 0.2. This unit is adjacent to the main tributary of sub-basin 3.

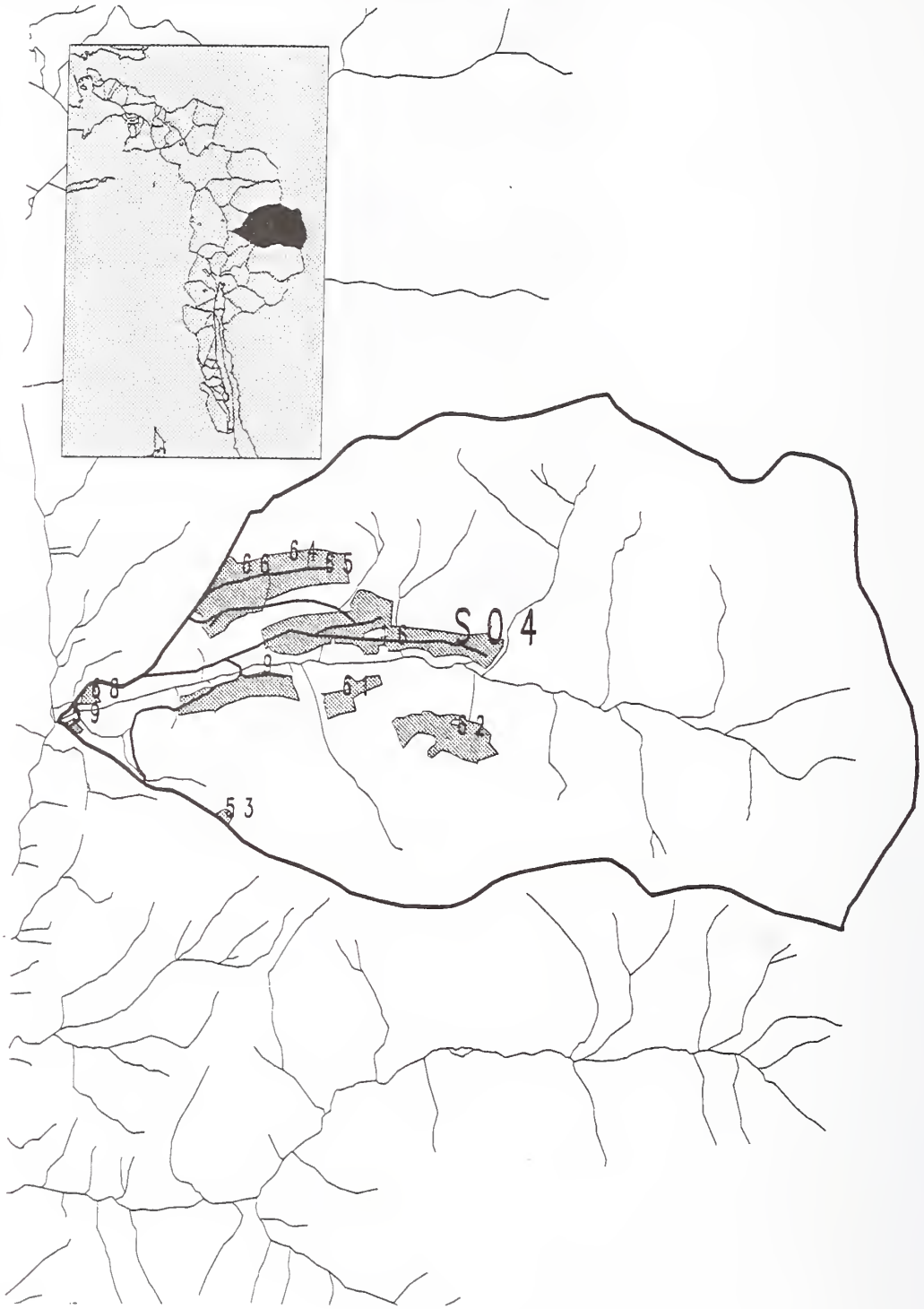
Class II MC1 stream north: 100 foot buffer (BMP 12.6 & 12.6a)

Unit 132

Unit 132 is a 24 acre clearcut adjacent to one resident fish bearing stream. The SDPI rating for this unit is 0.1 and reflects close proximity to class II resident fish habitat.

- Class II MC1 stream south (TTRA): 100 foot buffer (BMP 12.6 & 12.6a)

Figure F-21
Carroll Creek Sub-basin 4



Carroll Creek Sub-basin 4

Unit 9

Unit 9 is a 93 acre that is adjacent to a Class II resident fish stream and three water quality streams. The SDPI rating for this unit is 6.2 indicating the steepness of the slope and close proximity to Class II fish habitat. Recommend dropping the settings below the road due to the presence of MMI 4 soils in that area.

- Class II MM1/MM2 north (TTRA): 120 foot buffer (BMP 12.6 & 12.6a)
- Class III AF2 east: 140 foot buffer (BMP 12.6 & 12.6a)
- Class III HC5 west: sideslope buffer (BMP 12.6 & 12.6a)
- Class III HC5 northcentral: split yarding and full suspension required (BMP 13.9)

Unit 16

Unit 16 is a 114 acre clearcut that is bordered by one Class II resident fish stream with 3 water quality streams extending into the unit. The high relief value, proximity to class II resident fish habitat, and number of sensitive water quality streams produced a SDPI rating of 10.0. Due to wind patterns in the sub-basin and existing windthrow, buffering class III streams is not recommended. Field review has confirmed temperate sensitivy concerns for Class III streams within this unit. Recommend mitigating the effects with sideslope or patial cut buffers on significant water quality channels.

- Class II MM1/MM2 stream south (TTRA): 120 foot buffer (BMP 12.6 & 12.6a)
- Class III HC5 stream west: partial cut buffer (BMP 12.6 & 12.6a)
- Class III HC5 stream central: extended sideslope buffer (BMP 12.6 & 12.6a)
- Class III HC6 stream east: split yarding or full suspension (BMP 13.9)
- Class III AF2 east: sideslope buffer (BMP 12.6 & 12.6a)

Unit 53

Unit 53 is a 31 acre clearcut located high on the ridge in reach R3 with a SDPI rating of 0.6. Although this unit is not in close proximity to fish habitat, extensive midslope roading is required to access the timber. Recommend a review of logging systems prescribed for this unit.

Unit 61

Unit 61 is a 26 acre clearcut that has one sensitive water quality stream flowing adjacent to the western unit boundary. The SDPI is rating for this unit is 0.4. Recommend additional protection on Class III due to the extreme incision depth/gradient on this stream.

- Stream Class III AF2/HC6 west: 140 foot sideslope buffer (BMP 13.9)

Unit 62

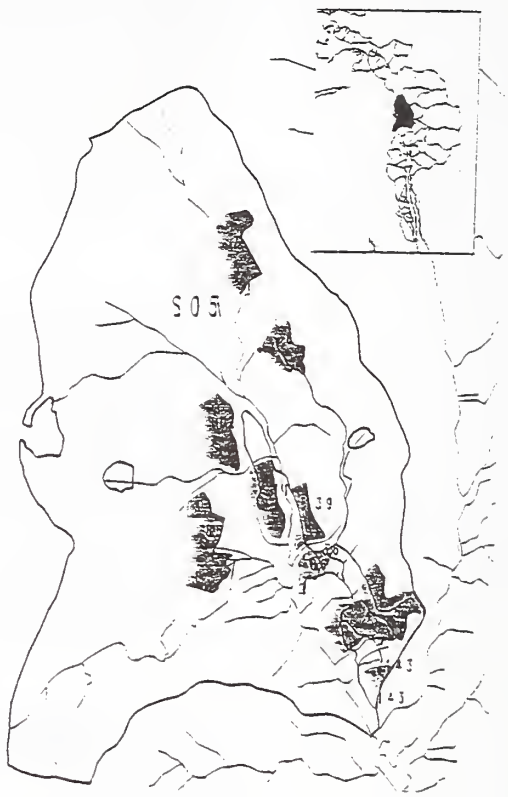
Unit 62 is a 44 acre clearcut that has one water quality stream located within the unit boundary. The SDPI rating for this unit is 3.0 indicating the steepness of the slope. Helicopter yarding is planned for this unit.

- Class III HC6 central: split yarding and full suspension required (BMP 13.9)

Units 64, 65, and 66

There are no fisheries or watershed concerns with these units.

Figure F-22
Carroll Creek Sub-basin 5



Carroll Creek Sub-basin 5

Unit 4
Unit 4 is an 81 acre clearcut split by the sub-basin/reach boundary with sub-basin S05 (21 acres are located within reach R3). The harvest unit is bordered by the mainstem (east), the west fork (south) and surrounds several other fish streams. The MM2 stream reaches located in the northeast corner of the unit are well developed alluvial channels. Settings 1 and 2 should be reviewed prior to implementation. Recommend trimming unit boundary to apply additional stream buffers. The SDPI ratings for this harvest unit are 0.2 and 2.3 for reach R3 and sub-basin S5 respectively.

- Class I FP5 stream south (TTRA): 300 foot buffer (BMP 12.6 & 12.6a)
- Class I LC2 stream east (TTRA): 200 foot buffer (BMP 12.6 & 12.6a)
- Class I FP4 stream southeast (TTRA): 260 foot buffer (BMP 12.6 & 12.6a)
- Class II HC2 streams southwest (TTRA): 120 foot buffer (BMP 12.6 & 12.6a)
- Class II MM2 stream southwest (TTRA): 120 foot buffer (BMP 12.6 & 12.6a)
- Class II MM2 (main channel) stream northwest (TTRA): 200 foot buffer (BMP 12.6a)

Unit 5
Unit 5 is an 81 acre clearcut split by the sub-basin/reach boundary with sub-basin S05 (10 acres are located within reach R3). The harvest unit contains two water quality streams and is bordered by the mainstem (east) and a water quality to the northwest. Special consideration should be given to settings 3 and 4. Recommend relocation of the road to minimize the

number of stream crossings and/or passage requirements. The SDPI ratings for this harvest unit are 0.3 and 2.4 for reach R3 and sub-basin S5 respectively.

- Class I MC3 stream reach east (TTRA): 100 foot buffer (BMP 12.6 & 12.6a)
- Class III HC5 stream northwest: 75 foot sideslope buffer (BMP 13.9)
- Class III HC2 and HC3 streams central: split yarding or full suspension (BMP 13.9)

Unit 6

Unit 6 is a 44 acre clearcut located in the headwaters of sub-basin S05. The v-notch to the west is deeply incised and will require additional protection. SDPI is 1.9. Recommend helicopter yarding to minimize road construction activities in the sub-basin.

- Class III HC2 stream central: split yarding or full suspension (BMP 13.9)
- Class III HC2 stream west: sideslope buffer (BMP 12.6 & 12.6a)

Unit 7

Unit 7 is a 36 acre clearcut located in the headwaters of sub-basin S05. The SDPI is 0.8. Recommend helicopter yarding to minimize road construction activities in the sub-basin.

- Class III HC6 stream west: sideslope buffer (BMP 12.6 & 12.6a)
- Class III HC5 stream south: split yard and full suspension required (BMP13.9)

Unit 11

Unit 11 is a 29.9 acre clearcut bordered by the main tributary of the mainstem. Recommend helicopter yarding to minimize road construction activities in the sub-basin. The SDPI rating for this unit is 1.5. Field verification is required for HC4 stream north.

- Class I MM1/MC1 stream east (TTRA): 120 foot buffer (BMP 12.6 & 12.6a)
- Class II HC2 stream south (TTRA): 100 foot buffer (BMP 12.6 & 12.6a)
- Class II HC4 stream north (TTRA): 100 foot buffer (BMP 12.6 & 12.6a)

Unit 12

Unit 12 is a 38.3 acre clearcut adjacent to the main tributary in the sub-basin. Helicopter yarding is recommended due to the high slope of the unit. The SDPI rating is 0.6.

- Class I MC1 stream east (TTRA): 100 foot buffer (BMP 12.6 & 12.6a)
- Class III HC3 stream south: sideslope buffer (BMP 12.6 & 12.6a)

Unit 85

Unit 85 is a 50 acre clearcut near the headwaters of sub-basin S05. The SDPI rating of 9.2 reflects the high relief ratio and stream density. Although helicopter harvest is planned, recommend dropping southern portion of unit due to the presence of numerous water quality streams flowing directly into Class I fish habitat. If unit is logged as planned, the following is recommended:

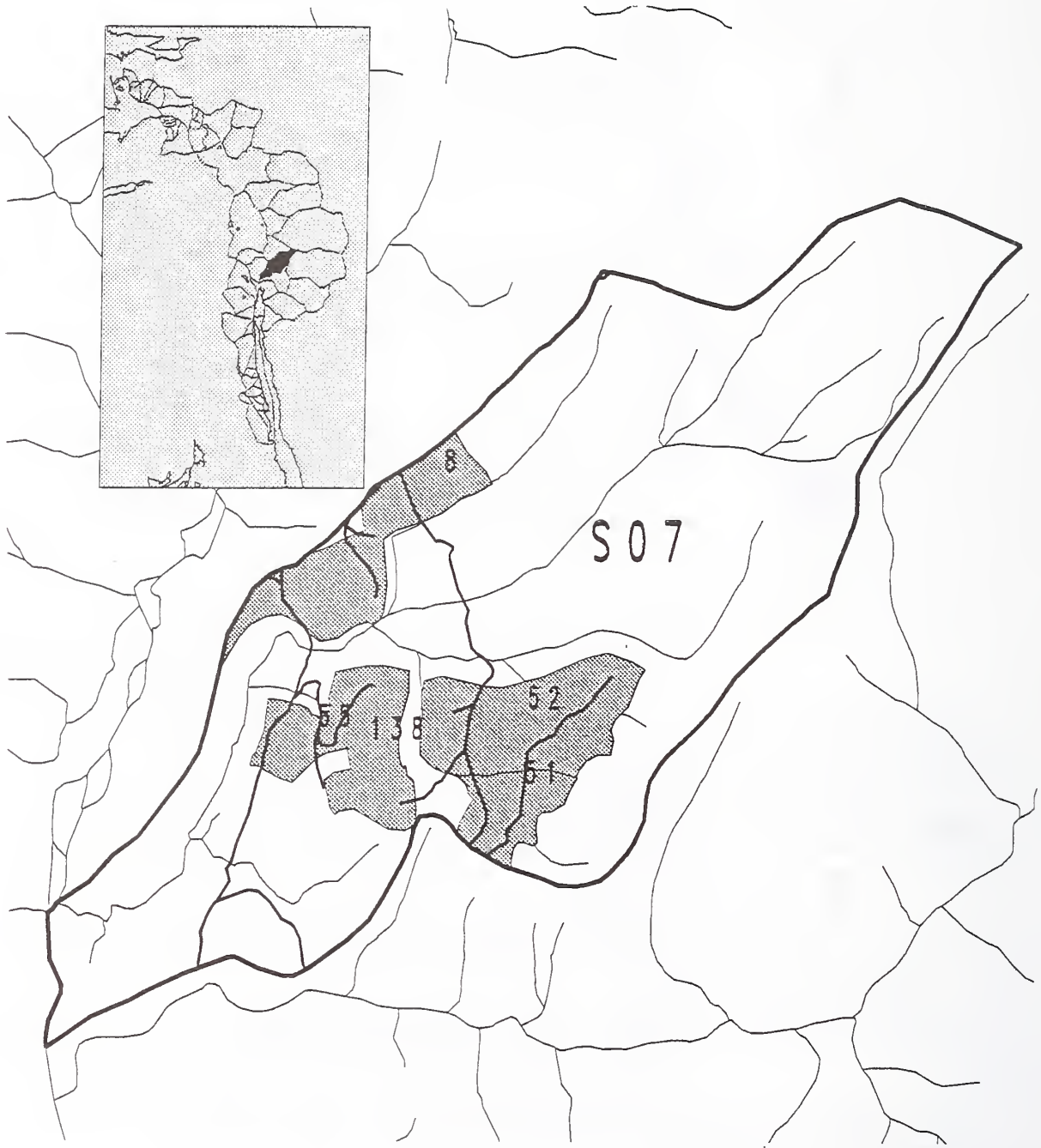
- Class III HC5 streams south: split yard and full suspension required (BMP 13.9).
- Class III HC5 stream north: sideslope buffer (BMP 12.6 & 12.6a)

Unit 86

Unit 86 is a 14.7 acre clearcut adjacent to the main fish bearing tributary. Recommend relocation of road accessing this unit to minimize the stream crossings. SDPI rating is 0.3.

- Class I MM1 stream west: 120 foot buffer (BMP 12.6 & 12.6a)
- Class I MC2 stream northwest: 100 foot buffer (BMP 12.6 & 12.6a)

Figure F-23
Carroll Creek Sub-basin 7



Carroll Sub-basin 7

Unit 8

Unit 8 is a 72 acre clearcut split by the boundaries with reaches R4 and R3. The harvest unit contains three water quality streams and is bordered by one to the south. The southwestern unit boundary is adjacent to the mainstem floodplain. Recommend deleting the portions of settings 1 and 3 west of proposed road. The SDPI ratings for this harvest unit are 0.8 (R3), 0.0 (R4), and 0.6 (S7).

- Class I FP5 stream southwest (TTRA): 300 foot buffer (BMP 12.6 & 12.6a)
- Class III HC5 streams northwest: split yarding or full suspension (BMP 13.9)
- Class III HC6 stream southeast: sideslope buffer (BMP 12.6 & 12.6a)

Unit 51

Unit 51 is a 32 acre clearcut split by the sub-basin/reach boundary with sub-basin S7 (7 acres are located within reach R5). The harvest unit contains two water quality streams . The SDPI ratings for this harvest unit are 0.1 (R5) and 0.6 (S7). Recommend deleting southern tip of unit that includes water quality stream and re-evaluate logging systems in the western corner.

- Class III HC5 stream south: sideslope buffer (BMP 12.6 & 12.6a)
- Class III HC4 stream central: split yarding or full suspension (BMP 13.9)

Unit 52

Unit 52 is a 48 acre clearcut that borders a deeply incised water quality stream. SDPI rating for this unit is 0.3. Recommend a sideslope buffer for the adjacent water quality stream.

- Class III HC6 stream northeast: split yarding and full suspension required (BMP 13.9)
- Class III HC5 stream north: sideslope buffer (BMP 12.6 & 12.6a)

Unit 55

Unit 55 is an 18 acre clearcut immediately adjacent to Class I habitat in the Carroll Creek floodplain. Recommend harvest unit be reconfigured to exclude MC2 reach of resident fish habitat.

- Class II MC2 stream north (TTRA): 100 foot buffer (BMP 12.6 & 12.6a)
- Class I FP3 stream east (TTRA): 260 foot buffer (BMP 12.6 & 12.6a)

Unit 138

Unit 138 is a 30.7 acre unit and is located in the lower portion of sub-basin 7. The SDPI rating is 0.2. There are no fisheries or watershed concerns in this unit.

Figure F-24
Carroll Creek Sub-basin 8



Carroll Sub-basin 8

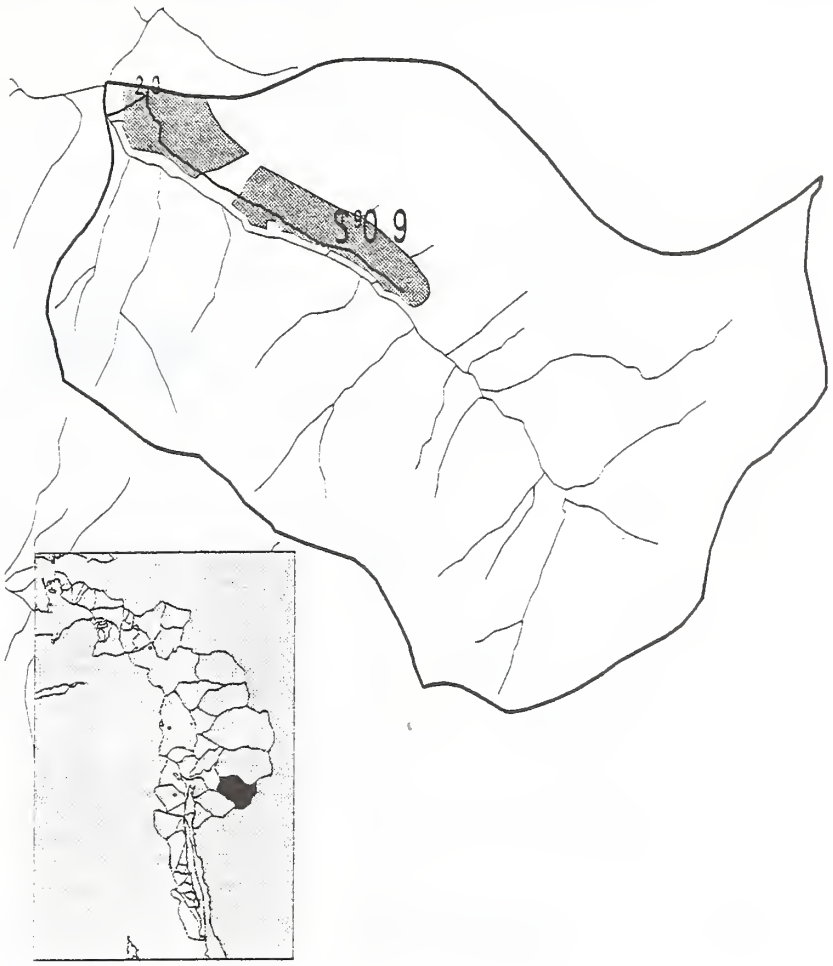
Unit 21
Unit 21 is an 8 acre unit that is proposed to be helicopter yarded. There is one water quality stream that flows adjacent to the eastern unit boundary. The SDPI rating for this unit is 0.1.

- Class III HC6 stream east: sideslope buffer (BMP 12.6 & 12.6a)

Unit 22
Unit 22 is a 33 acre clearcut adjacent to and containing one resident fish stream and one water quality stream. The SDPI rating for this unit is 0.4 and reflects close proximity to resident fish habitat.

- Class II MM1 stream south (TTRA): 120 foot buffer (BMP 12.6 & 12.6a)
- Class III HC6 stream central: split yarding and full suspension (BMP 13.9)

Figure F-25
Carroll Creek Sub-basin 9



Carroll Sub-basin 9

Unit 19

Unit 19 is a 21 acre clearcut that is adjacent to one resident fish bearing stream. The SDPI rating for this unit is 0.4 and reflects the close proximity to resident fish habitat.

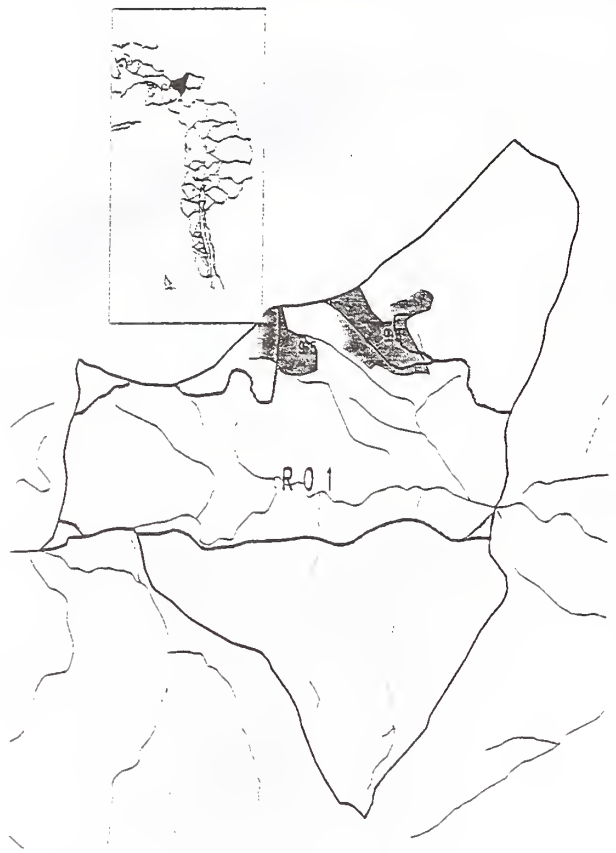
- Class II MM1 stream south (TTRA): 120 foot buffer (BMP 12.6 & 12.6a)

Unit 20

Unit 20 is a 44 acre clearcut bordered by one resident fish stream with one water quality stream extending into the unit. The SDPI rating for this unit is 1.0 and reflects the close proximity to resident fish habitat.

- Class II MM1 stream southwest (TTRA): 120 foot buffer (BMP 12.6 & 12.6a)
- Class III HC4 stream central: split yarding and full suspension (BMP 13.9)

Figure F-26
Neets Bay Reach 1



Neets Bay Reach 1

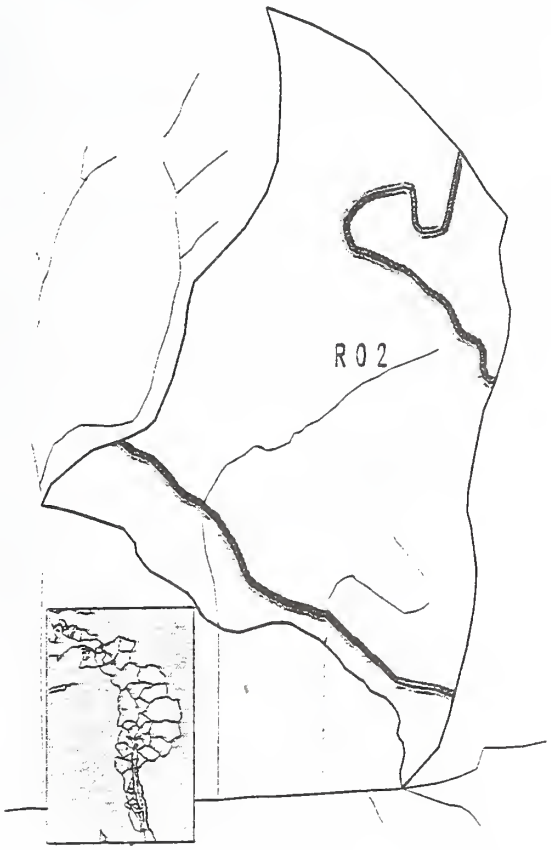
Unit 93
Unit 93 is a 57 acre clearcut adjacent to and containing two water quality streams. GIS stream classification indicates the stream located within the unit is classified incorrectly. Field reconnaissance verified that the PA1 stream is a Class III, not Class I. The SDPI rating for this unit is 2.6. Recommend deleting southwest boundary due to the presence of MMI 4 soils. Although this unit was previously identified as temperature sensitive, no additional mitigation will be required.

- Class III HC5 stream east boundary: sideslope buffer (BMP 12.6 & 12.6a)
- Class III PA1 stream southwest: split yarding or full suspension (BMP 13.9)

Unit 95
Unit 95 is a 20 acre clearcut adjacent to and containing two water quality streams. The SDPI rating for this unit is 0.2.

- Class III HC1 stream south: sideslope buffer (BMP 12.6 & 12.6a)
- Class III HC1 stream north: split yarding or full suspension (BMP 13.9)

Figure F-27
Neets Bay Reach 2



Neets Bay Reach 2

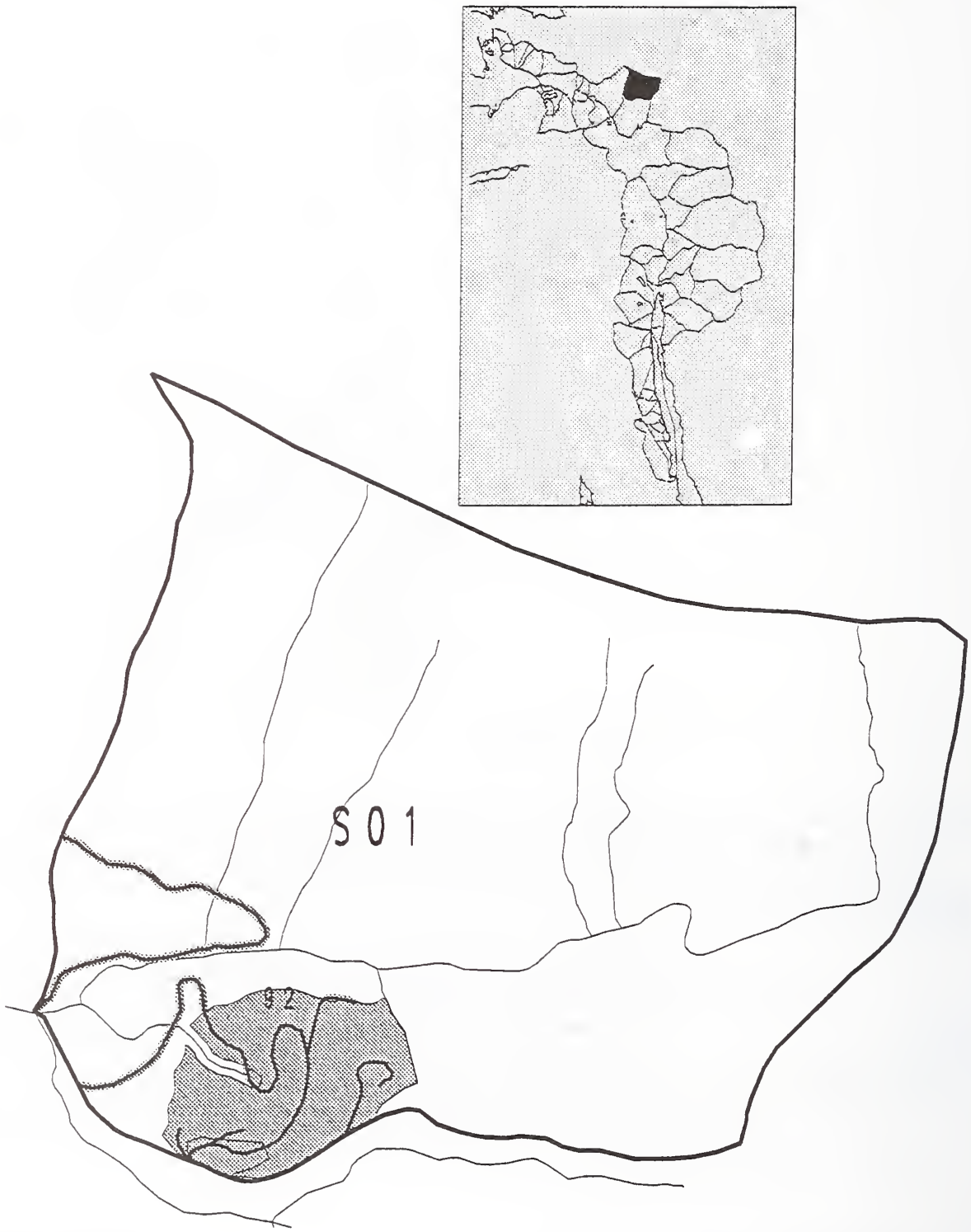
Unit 128
Unit 128 is a 15 acre clearcut that contains one water quality stream located in the central part of the unit. Unit 128 is planned to be helicopter yarded and has a SDPI rating of 2.4.

- Class III HC5 stream central: directional felling and full suspension (BMP 13.9)

Unit 106
Unit 106 is a 47 acre clearcut that is adjacent to and containing six water quality streams. Approximately 25 acres is located within reach R4. The SDPI rating is 10.0 due to the steepness of the unit and number of water quality streams located within the unit boundary. Recommend deleting the southwest portion of unit due to the presence of MMI 4 soils.

- Class III HC6 stream north: sideslope buffer (BMP 12.6 & 12.6a)
- Class III HC6 streams southeast, northeast: split yarding and full suspension (BMP 13.9)
- Class III HC5 streams north central: split yarding and full suspension (BMP 13.9)

Figure F-28
Neets Bay Sub-basin 1



Neets Bay Sub-basin 1

Unit 94

Unit 94 is a 23 acre clearcut that borders one water quality stream and one resident fish stream. The SDPI rating for this unit is 0.1 and reflects the unit's close proximity to fish habitat. Recommend reconfiguring the unit to provide adequate stream buffers along the Class II stream.

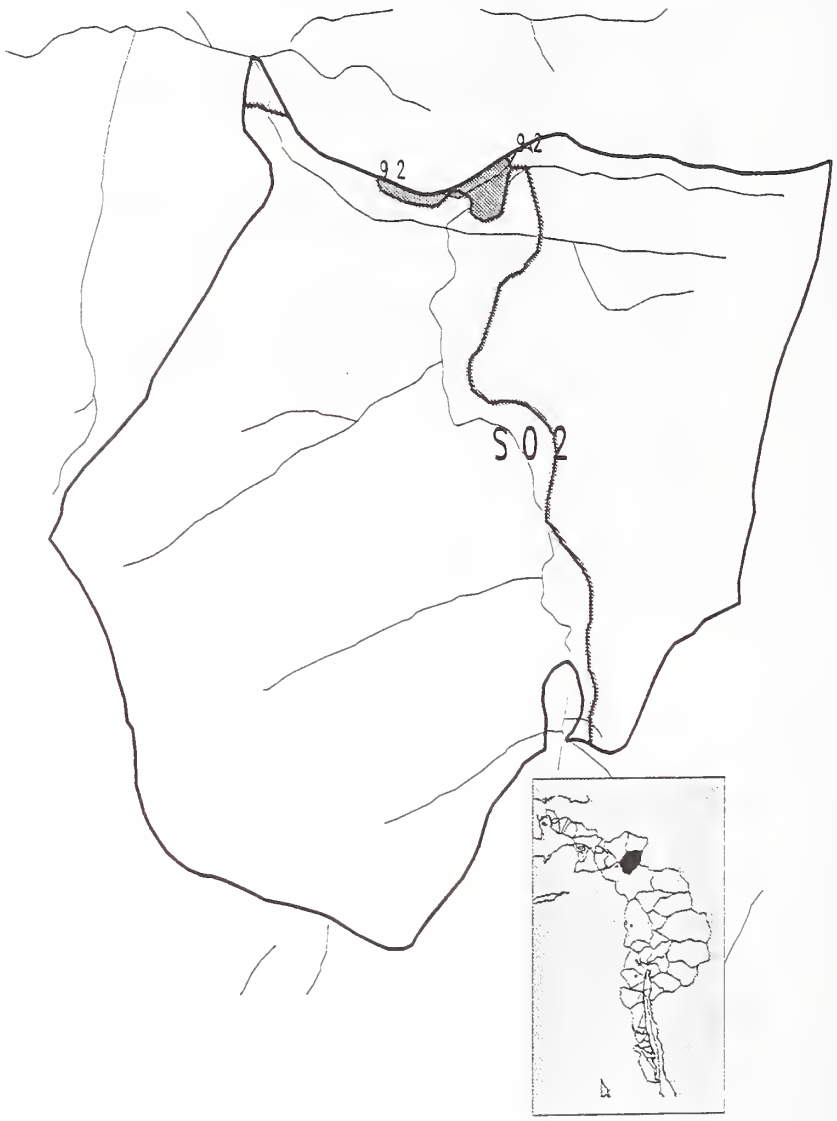
- Class II MM2 stream north (TTRA): 120 foot buffer (BMP 12.6 & 12.6a)
- Class III HC5 stream east: sideslope buffer (BMP 12.6 & 12.6a)

Unit 92

Unit 92 is a 74 acre clearcut that is adjacent to and containing one water quality stream and two class II streams. The SDPI rating for this unit is 0.2 and reflects close proximity to fish habitat. Recommend reconfiguring the unit to provide adequate stream buffers along the Class II streams.

- Class II AF1 stream west: split yarding and full suspension required
- Class II MM2 stream north (TTRA): 120 foot buffer (BMP 12.6 & 12.6a)
- Class III HC5 stream east: sideslope buffer (BMP 12.6 & 12.6a)

Figure F-29
Neets Bay Sub-basin 2



Neets Bay Sub Basin 2

Unit 91
Unit 91 is a 30 acre clearcut that contains three water quality streams. The SDPI rating for this unit is 0.1.

- Class III HC5 stream north: split yarding and full suspension (BMP 13.9)
- Class III HC5 stream south: split yarding and full suspension (BMP 13.9)
- Class III HC5 stream southeast: split yarding and full suspension (BMP 13.9)

Monitoring Objectives and Recommendations

Routine implementation monitoring will be conducted by the timber sale administrator and road engineer, who will be primarily responsible for ensuring the implementation of procedures specified on the unit and road cards. Culverts, permeable subgrade materials, buffers, and controlled felling and yarding of trees away from streams are the BMPs designed to protect wetlands, floodplains, and riparian areas. The sale administrator will be supported by District resource specialists who will document BMP implementation observed during field investigations. If resource specialists observe situations where BMPs are not being implemented, they will report their findings to the sale administrator for immediate attention.

Effectiveness monitoring includes both routine field observations and comprehensive monitoring projects. Routine effectiveness monitoring includes visual observations and documentation. Visual observations include road runoff, proper culvert and bridge placement procedures, water turbidity at culverts and bridges, and revegetation. The sale administrator and road engineer will document such observations and include them in contract administration reports. Resource specialists from the District Office will also conduct harvest inspections and will provide written documentation to the timber sale administrator.

Watershed Scale Reserves

Objective: to maintain dynamic freshwater habitats through time.

Recommend management activities outlined in the Record of Decision (ROD) attempt to mimic natural disturbance cycles. Rather than disperse harvest units throughout the watershed, focus activities in specific sub-basins and reaches. Manipulating management activities in this manner retains the ecological processes necessary to create and maintain freshwater habitats through time (Reeves et al. 1995).

The analysis identified Carroll Creek sub-basin S5 (west fork) as the highest risk in terms of sediment production and transport at the watershed scale. This sub-basin also provides valuable spawning and rearing areas for anadromous and resident fish. Therefore, it is recommended that timber harvest be deferred from this sub-basin in the ROD and management activities be concentrated on the east side of Carroll Creek. If deferred, sub-basin S5 will provide valuable refugia for this planned disturbance regime.

Deferring timber harvest in sub-basin S5 for this rotation will also provide a unique monitoring opportunity. Existing channel condition transects and temperature monitoring stations will act as a control for the remainder of the watershed.

Stream Channel Response

Objective: To evaluate potential cumulative effects of sediment deposition on stream channel condition in sensitive Class I stream segments.

Permanent reference cross sections have been established in sub-basin S5, reach R4, and reach R5. Reaches will be re-measured periodically to evaluate changes (if any) in channel condition and fish habitat. The core monitoring parameters are channel form (measured at monumented cross sections), substrate size distribution, and key fish habitat indices such as pool and large woody debris data.

Temperature

Objective: To evaluate stream temperature trends in the Project Area.

Thermographs are currently in place at the outlets of sub-basins S4, S5, and reach R5 to measure daily ranges in stream temperature. Temperature data will be retrieved annually and compared to state water quality standards. Results will be documented at the Ketchikan Ranger District

Additional monitoring is recommended for temperature sensitive streams in the Project Area. The following units were originally identified as having a potential to increase temperature sensitivity of nearby streams: 4, 16, 57, 93, 5, 19. After field review, it was determined that only unit 16 will require additional mitigation . It is recommended that sideslope or partial cut buffers are implemented for significant water quality streams within this unit.

To accomplish effective monitoring of stream temperatures in both the water quality and adjacent resident fish stream, thermographs should be placed in the following locations:

1. Class II stream channel immediately upstream of harvest unit boundary
2. Class III stream channels downstream of harvest unit boundary before entering mainstem
3. Class II stream channel immediately downstream of harvest unit boundary

Buffer Stability on Class III V-notches

Ojective: To determine the effectiveness of sideslope buffers in the Project Area.

Sideslope buffers have been prescribed for a large number of Class III V-notches in the Project Area. With the increasing focus on the protection of headwater streams, it is important to evaluate the effectivenes of different management options.

Harvest unit 16 is located in sub-basin S4 and received the highest Sediment Delivery Potential Index score . Watershed level analysis further identified sub-basin S4 as the second highest risk for sediment transport in the watershed. Potential temperature sensitivity concerns and windthrow have also been documented in this unit. For these reasons, it is recommended that unit 16 be specifically designed to mitigate potential temperature sensitivity risks and to monitor the effectiveness of different Class III V-notch prescriptions.

- Class III HC5 stream west: partial-cut buffer (BMP 12.6 & 12.6a)
- Class III HC5 stream central: extended sideslope buffer (BMP 12.6 and 12.6a)
- Class III HC6 stream east: split yarding or full suspension (BMP 13.9)
- Class III AF2 stream east: 140 foot buffer (BMP 12.6 & 12.6a)

District Fish Biologists will be responsible for annual inspection and evaluation of riparian management options.

Road Drainage Condition

Objective: To monitor the effectiveness of road design and maintenance practices in minimizing impacts to water quality and fish passage.

Road condition surveys will be conducted two, five, and seven years after the completion of activities in the Project Area. The intent of the survey is to ensure that specified culverts are

providing fish passage and to identify maintenance concerns. Information collected from the surveys will be summarized and provided to the engineering staff.

Special consideration should be give to the road management objectives for high risk sub-basins S4 and S5. Due to their ability to transport sediment into critical watershed reaches, it is recommended that all roads other than the mainline be closed. Closure procedures should include removal of all culverts and bridges. These actions will greatly reduce the short- and long-term effects of road construction activities.

References Cited

Brooks, K. N., P. F. Ffolliott, H. M. Gregersen, and J. L. Thames, 1992. Hydrology and the management of watersheds. Iowa State University Press, pp. 178-179.

Bryant, M. D., B. W. Wright, and B. J. Davies, 1992. Application of hierarchical habitat classification system: Stream habitat and salmonid distribution in Ward Creek, Southeast Alaska. Research Note PNW-RN-508. U. S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, OR.

Dunne, T. and L. B. Leopold, 1978. Water in environmental planning. W. H. Freeman and Co.

Federal guide for pilot watershed analysis, v 1.2, 1994.

Geier T. W. and Loggy, W. D. 1995. A proposed geomorphic risk assessment of potential fish habitat impacts from forest management. In Proceedings: American Water Resources Association, Alaska Section. Publication # WRC-117, Water Research Center, Institute of Northern Engineering, University of Alaska, Fairbanks, AK.

Jones, S. H. and C. B. Fahl, 1994. Magnitude and Frequency of floods in Alaska and conterminous basins of Canada. USGS Water-Resources Investigations Report 93-4179, U. S. Geological Survey, Anchorage, AK.

KGIS, 1995. Ketchikan Area Geographical Information System. USDA Forest Service, Tongass National Forest, Ketchikan Area, Ketchikan, AK.

Levesque, S. P., 1995. Carroll Creek resource report. USDA Forest Service, Tongass National Forest, Ketchikan Ranger District, Ketchikan, AK.

Overton, C. K., M. A. Radko, and R. L. Nelson, 1993. Fish habitat conditions: Using the Northern/Intermountain Regions' inventory procedures for detecting differences in two differently managed watersheds. General Technical Report INT-300, USDA Forest Service, Intermountain Forest and Range Experiment Station, Odgen, UT.

Ralph, S., G. C. Poole, L. L. Loveday, and R. J. Naiman, 1994. Stream channel morphology and woody debris in logged and unlogged basins of western Washington. Canadian Journal of Fish and Aquatic Sciences, Vol. 51, pp. 37-51.

Reeves, G. H., L. E. Benda, K. M. Burnett, P. A. Bisson, and J. R. Sedell, 1995. A Disturbance-based ecosystem approach to maintaining and restoring freshwater habitats of evolutionary significant units of anadromous salmonids in the Pacific Northwest. American Fisheries Society Symposium, 17:334-349.

Rosgen, D., 1994. A classification of natural rivers. Catena 22:169-199.

Simons, D. B., R. M. Li, N. Duong, N. Kouwen, V. M. Ponce, E. V. Richardson, K. Schneider, S. A. Schumm, and R. K. Simons, 1980. Watershed and Stream Mechanics. USDA Soil Conservation Service, Washington, DC.

USFS, 1992. Channel type users guide for the Tongass National Forest, Southeast Alaska. USDA Forest Service, Alaska Region, Technical Paper R10-TP-26, Juneau AK.

Appendix G

LTF Reconnaissance Report
USDC National Marine Fisheries Service Report
Alaska Timber Task Force Siting Guidelines

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 1668
Juneau, Alaska 99802

September 27, 1983

Mr. Win Green
Forest Supervisor, Ketchikan Area
Tongass National Forest
Federal Building
Ketchikan, Alaska 99901

Dear Mr. Green:

As requested in your July 29, 1983, letter, attached is our investigation report and recommendations for some of the potential log transfer sites in you area. We appreciate the opportunity to evaluate these locations before they are formally presented in an environmental impact statement. This early involvement should help prevent further complications in selecting the sites that balance timber harvest needs with marine resource values.

Give our thanks to Jim Rhodes who was very helpful in providing site suitability information, and the other Forest Service personnel who provided assistance during the field investigations. Please contact Duane Petersen (586-7235), of our Environmental Assessment Division (Juneau Office) if you have any questions regarding this report.

Sincerely,

James W. Brooke

Robert W. McVey
Director, Alaska Region

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Environmental Assessment Division
Juneau, Alaska

and

U.S. Department of the Interior
Fish and Wildlife Service
Southeast Alaska Ecological Services
Juneau, Alaska

Report of Field Investigations
Carroll Inlet, Thorne Arm, Revillagigedo Island
Tokeen Bay, Kosciusko Island
Shelikof Island, Prince of Wales Island

July 18-21, 1983

In response to a request from the U.S. Forest Service, Ketchikan area, personnel from the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) investigated a number of proposed sites to determine their suitability for use as log transfer sites. Dumping logs into estuarines, where they are formed into rafts for transport to processing centers, results in massive loss of bark that settles to the bottom, smothering sessile plant and animal life and degrading habitat for motile animal life. By investigating proposed sites, the degree of potentially harmful impacts can be determined and recommendations made as to their suitability of each site for the operation of a log transfer facility.

Sites which were investigated for this report are located on Revillagigedo Island, Prince of Wales Island, and Kosciusko Island. (Figures 1-5)

OBJECTIVES

1. Investigate subtidal habitat and associated aquatic plants and animals that would be impacted by bark accumulation introduced by log transfer.

2. Determine the extent of biological production in terms of epibenthic animals and plants.

3. Investigate possible alternative sites in order to assess relative biological productivity among the sites.

METHODS

Duane Petersen (NMFS) and Everett Robinson-Wilson (USFWS) conducted this study, utilizing SCUBA to obtain underwater observations. A transect line marked in one-meter intervals, was attached near the high water mark and extended seaward at a right angle to the shore at each study site. Observations of plant life were made at five-meter intervals

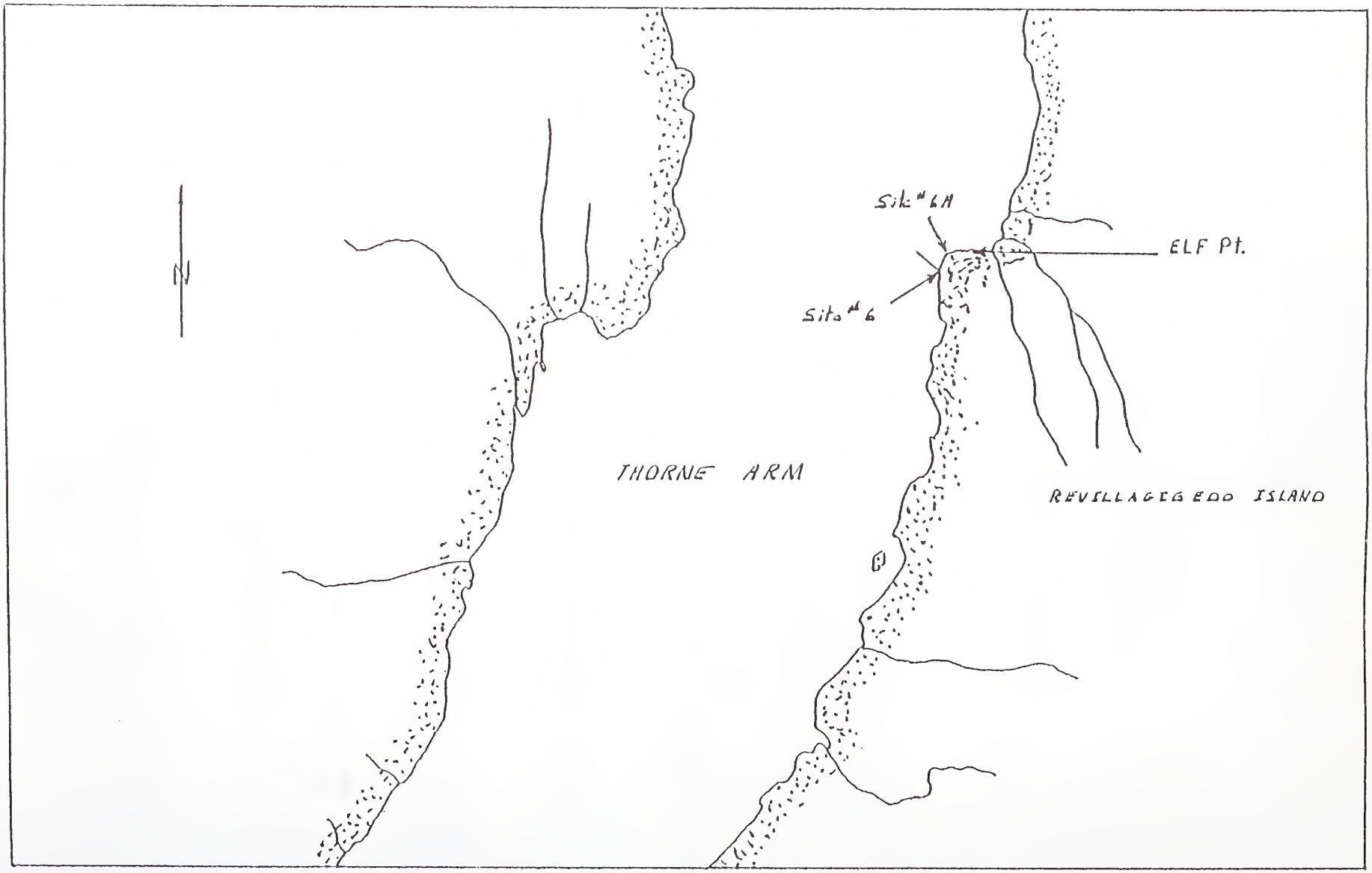


Figure 1. - Location of Sites 6, 6A, Thorne Arm, Revillagigedo Island.

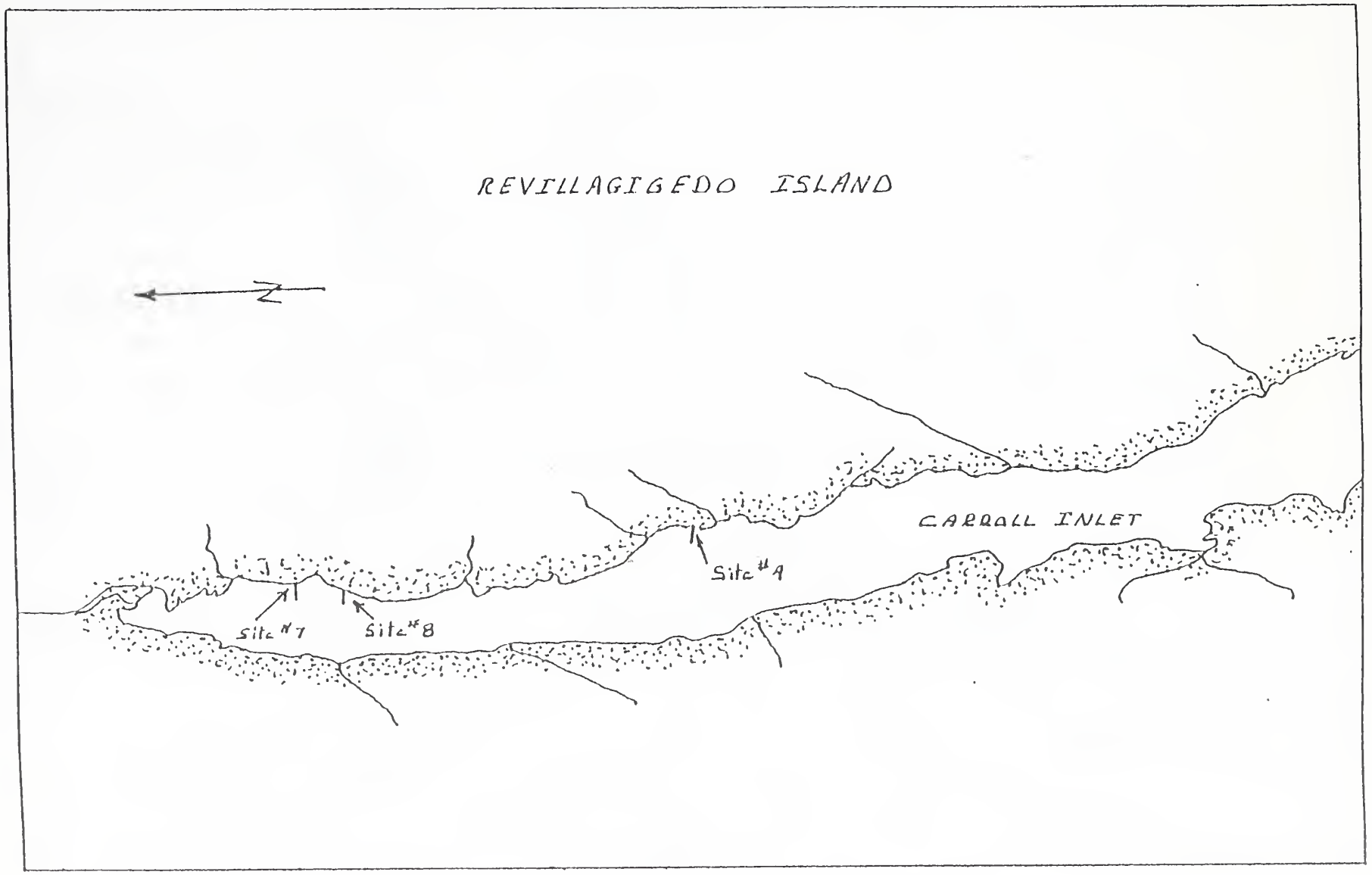


Figure 2. - Location of Sites #4, 7, and 8, Carroll Inlet, Revillagigedo Island.

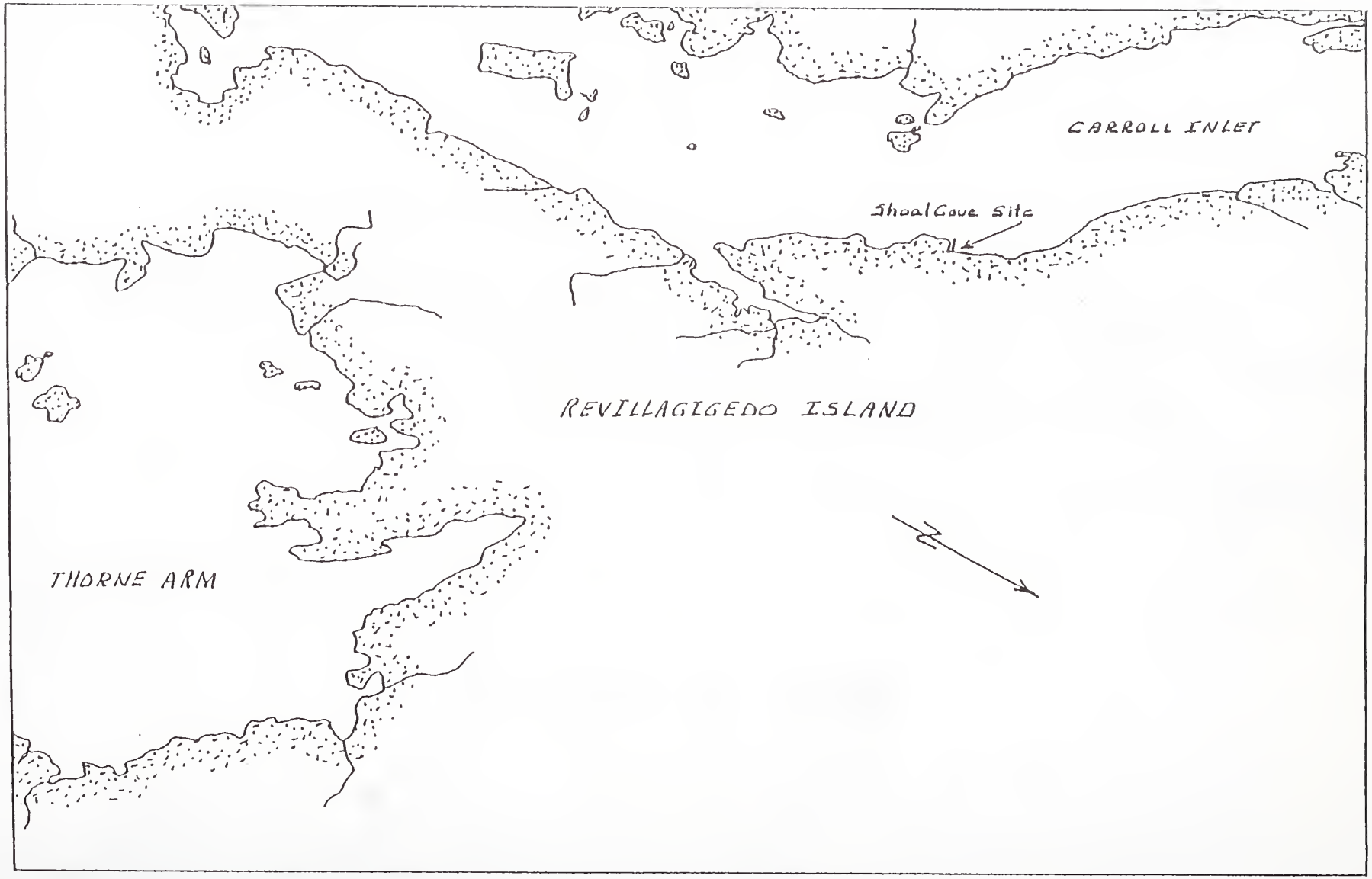


Figure 3. - Location of Shoal Cove Site, Carroll Inlet, Revillagigedo Island.

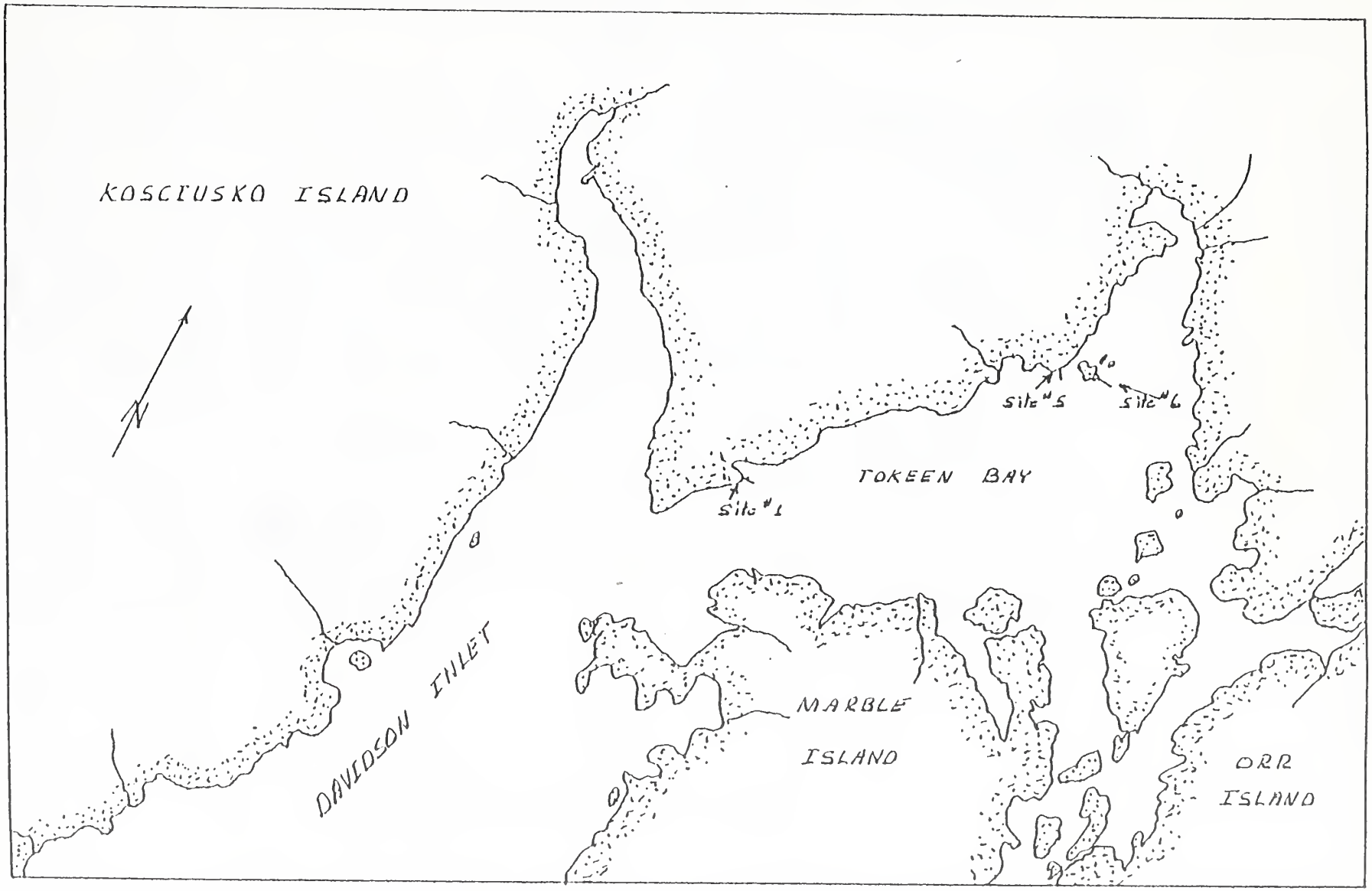


Figure 4. - Location of Sites #1, 5, 6, Tokeen Bay, Kosciusko Island.

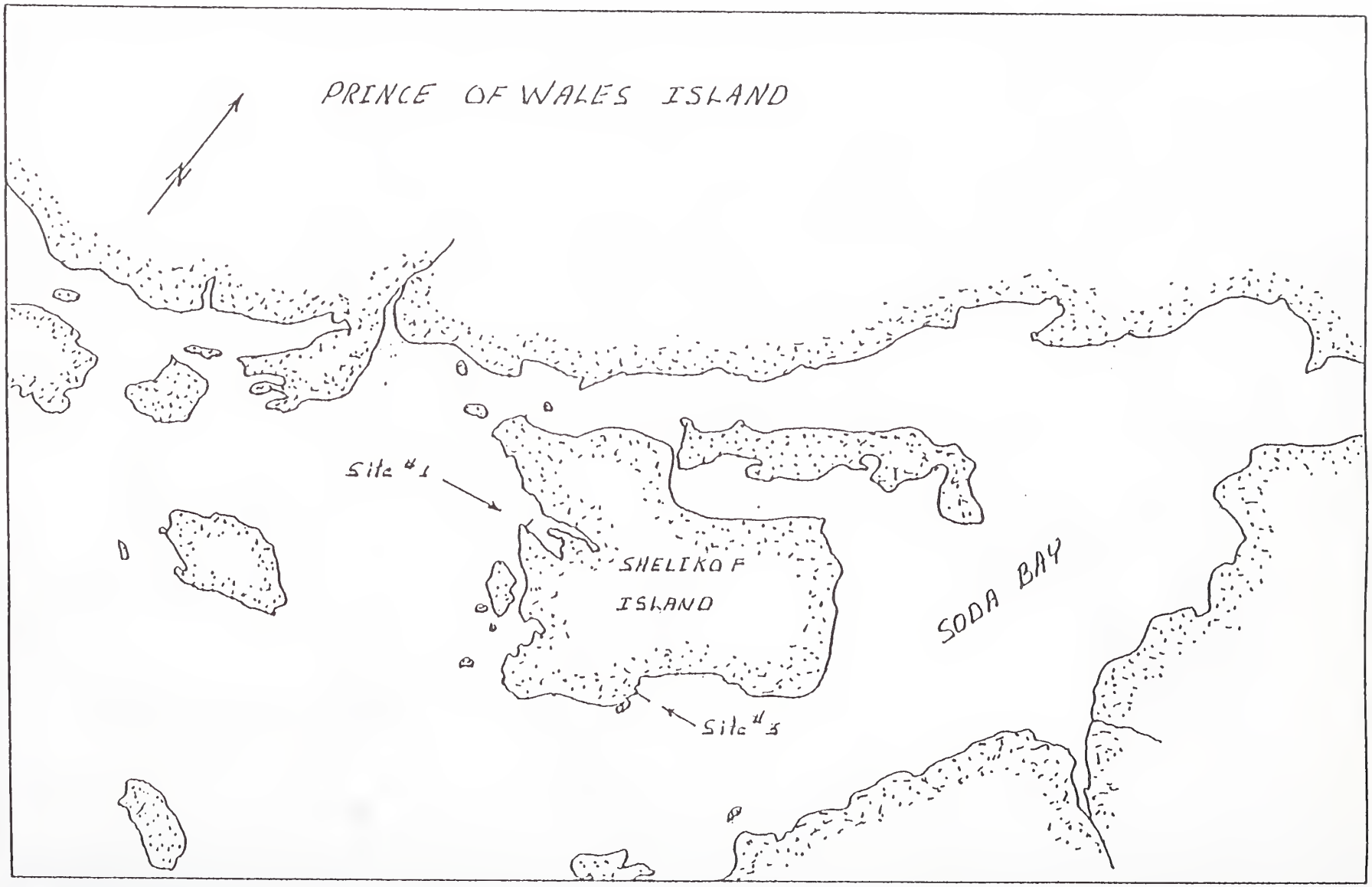


Figure 5. - Location of Sites #1, 3, Shelikof Island, Soda Bay, Prince of Wales Island.

along the transect line. Animals were observed while swimming through the area. Substratum composition and depth were noted and recorded. All observations were recorded on underwater paper.

RESULTS

Following is a description of each site. Profiles of the bottom are illustrated in Figures 6-15. Animals and plants associated with each site are listed in Table 1.

Thorne Arm

Site #6 - (Figure 6). Start of dive, 1114 hours; end of dive 1139 hours. The bottom drops gently from shore along slopes of about 11 degrees to a distance of 50 meters and then drops moderately along slopes of 18 degrees for a distance of 15 meters where the dive ended in a water depth of 13.7 meters, 65 meters from shore. The divers continued to swim along the transect to 70 meters from shore where the depth was 15.2 meters. At this point the bottom slope increased very rapidly. Substratum, from shore to a distance of 45 meters, is mostly bedrock grading into boulder and cobble. Beyond 35 meters, the substratum is composed of sand and shell. Bottom current speed, 70 meters from shore, was estimated between 1-2 knots. A moderately dense band of macrophytic algae occurs to 55 meters from shore. Animal species composition is diverse and numbers of organisms are abundant in the vegetative zone, but become more sparse as the substratum becomes more sand and shell.

Site #6A - This site, Figure 1, was not investigated using a transect line. The bottom profile is similar to Site #6 except the vegetation zone extends to about 20 meters from shore. The subsurface slope is steeper (25-30 degrees) and a depth of 15.2 meters was obtained about 30 meters from shore.

Carroll Inlet

Site #4 - (Figure 7). Start of dive, 1040 hours; end of dive, 1055 hours. The bottom drops moderately along a slope of 30 degrees for a distance of 15 meters from shore and then drops moderately along an average slope of 17 degrees to 65 meters from shore; maximum water depth was 12.2 meters. Substratum, from shore to a distance of 15 meters is bedrock, boulders, and cobbles changing to gravel, sand, and mud for a distance of 50 meters and beyond. Macophytic algae occur sparsely to 15 meters from shore. Various animal species are present but species diversity and numbers of organisms were sparse.

Site #7 - (Figure 8). Start of dive, 1140 hours; end of dive 1154 hours. The bottom drops moderately along an average slope of 20 degrees to a distance of 35 meters from shore and then flattens out to beyond 50 meters; maximum water depth was 12.2 meters. Substratum, from shore to a distance of 15 meters, is mostly boulders and silt. Beyond 15 meters, the substratum is composed of silt mixed with woody debris. A sparse band of macrophytic algae occurs from shore to 25 meters. Animal species were very sparse both in diversity and numbers.

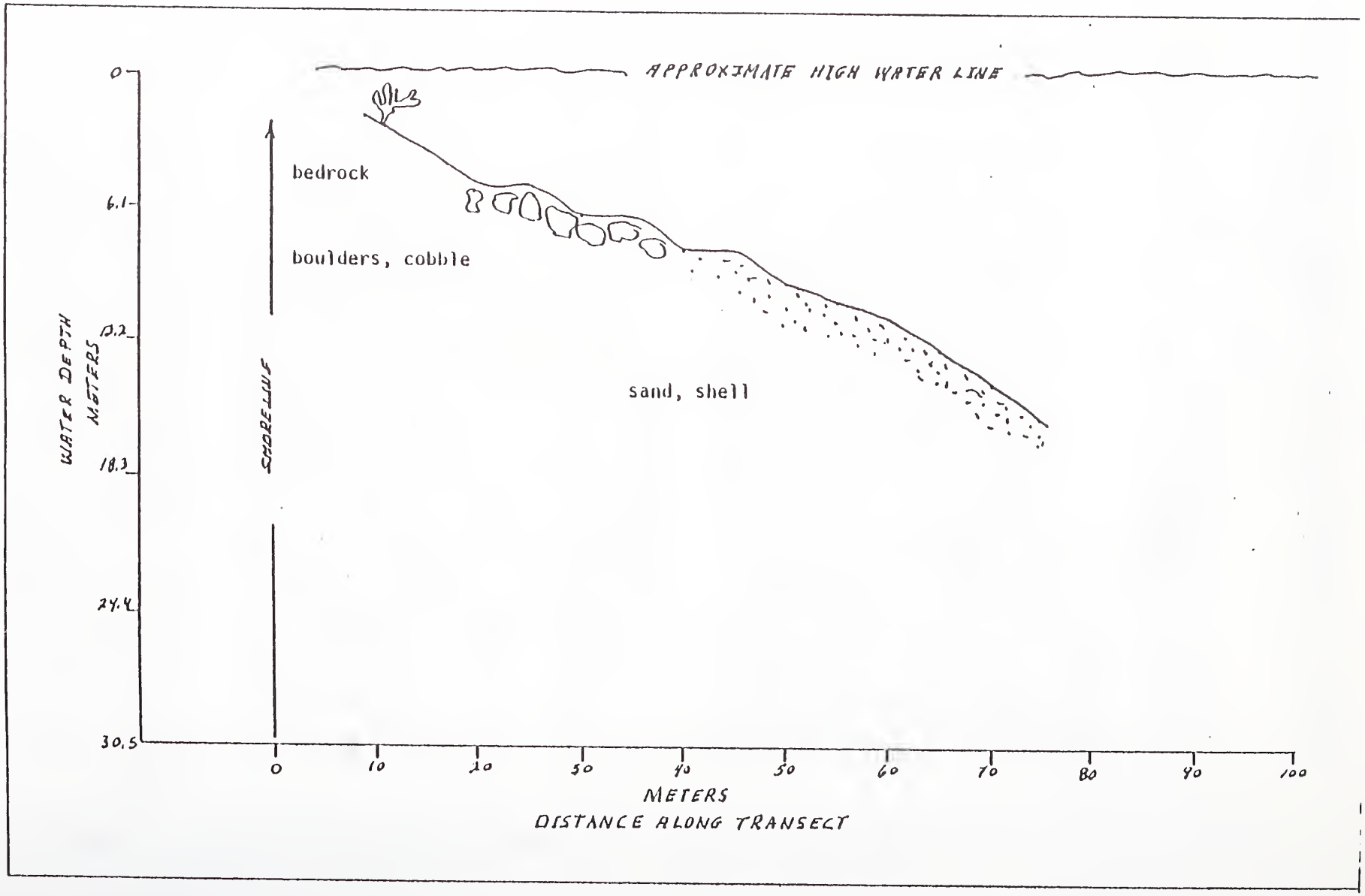


Figure 6. - Bottom profile, Site #6, Thorne Arm.

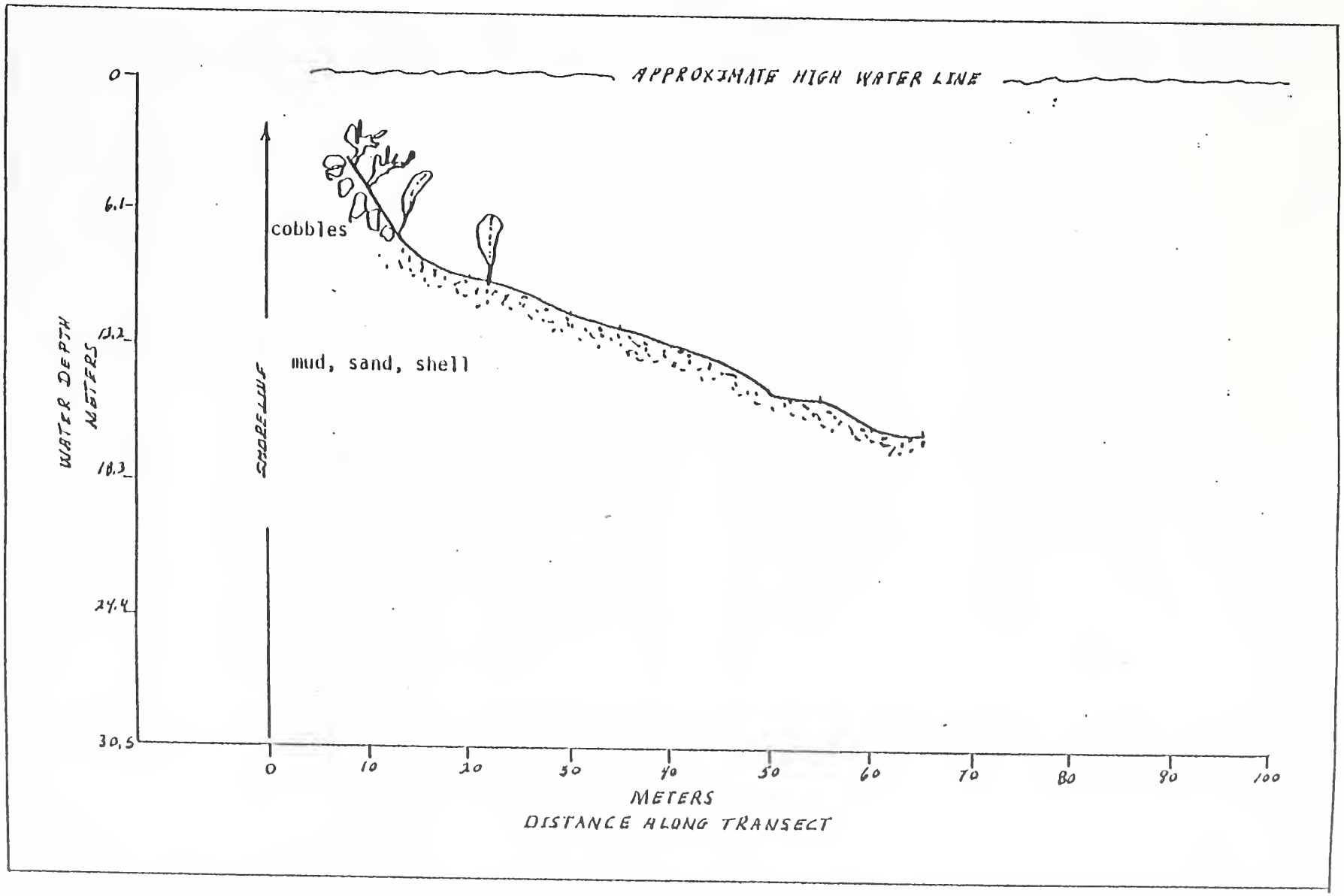


Figure 7. - Bottom profile, Site #4, Carroll Inlet.

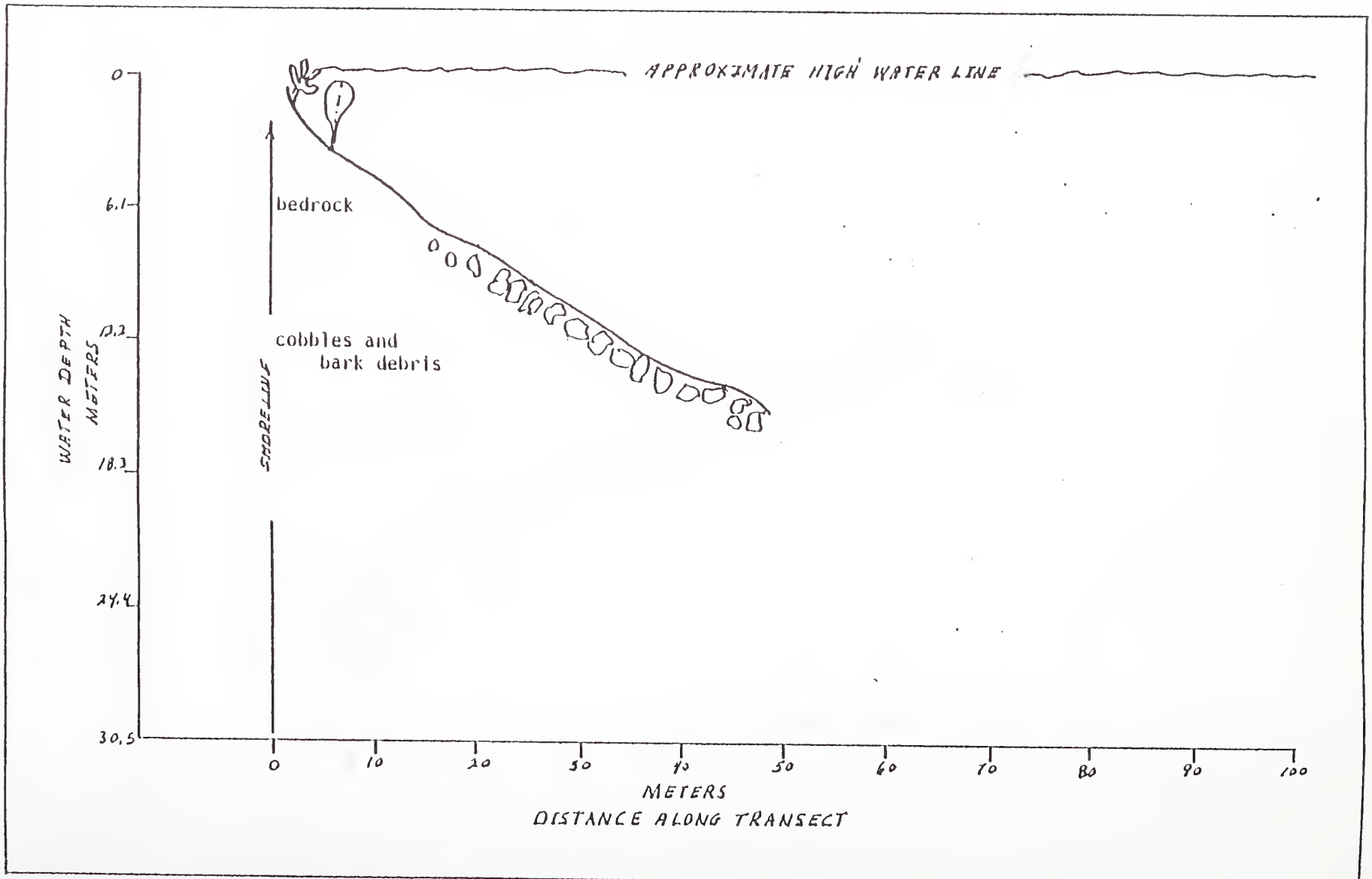


Figure 8. - Bottom profile, Site # 7, Carroll Inlet.

Site #8 - (Figure 9). Start of dive, 1222 hours; end of dive, 1235 hours. The bottom drops moderately from shore along slopes averaging 23 degrees to a distance of 45 meters and beyond. Substratum, from shore to a distance of 45 meters, is mostly bedrock with small areas of sand and shell. Macrophytic algae occur on about 3 percent of the bedrock's surface. Few animal species are present, at least during the time of this investigation.

Shoal Cove - (Figure 10). Start of dive, 1340 hours; end of dive 1400 hours. The bottom drops along an average slope of 13 degrees to a distance of 80 meters from shore, however, the actual contour is step like. Substratum, from shore to a distance of 15 meters, is mostly cobble. Beyond 15 meters, the substratum is composed of fine to course woody debris to 70 meters from shore. A substratum of shell and sand extended beyond 70 meters; maximum water depth was 19.8 meters. Animal species were few with the sea cucumber being most abundant.

Tokeen Bay

Site #6 - (Figure 11). Start of dive, 0930 hours; end of dive, 0945 hours. The bottom slopes moderately from shore along an average slope of 28 degrees. Substratum from shore to a distance of 45 meters is bedrock with pockets of sand and shell. Macrophytic algae occur along the rock surface in dense bands to 30 meters from shore. Animal species composition is diverse and numbers of organisms are abundant in the vegetative zone, but become more sparse at depths deeper than 12 meters, 30 meters from shore.

Site #5 - (Figure 12). Start of dive, 1012 hours; end of dive 1027 hours. The bottom drops moderately along an average slope of 19 degrees to a distance of 55 meters from shore. Substratum from shore to a distance of 20 meters, is mostly bedrock. Beyond 20 meters, the substratum is composed of sand and shell. A moderately dense band of macrophytic algae occurs along the rock and cobble surfaces to 30 meters from shore. Various animal species are present in the vegetative zone but become sparse in water deeper than 15 meters, 40 meters from shore.

Site #1 - (Figure 13). Start of dive, 1025 hours; end of dive 1041 hours. The bottom drops moderately along an average slope of 18 degrees to 45 meters from shore, levels off and drops gently beyond 55 meters. Substratum, from shore to a distance of 30 meters, is mostly bedrock. Beyond 30 meters, the substratum is composed of boulders and cobble grading into sand and shell. A moderately dense band of macrophytic algae occurs along the bedrock and boulder surfaces to 35 meters from shore. Various animal species are present in the vegetative zone but become sparse in water deeper than 11 meters, 40 meters from shore.

Shelikof Island

Site #1 - (Figure 14). Start of dive, 1019 hours; end of dive, 1035 hours. The bottom drops moderately from shore along a slope of 25 degrees to a distance of 20 meters from shore and then drops gently along slopes of 7 to 11 degrees to 65 meters from shore. Substratum, from shore to a distance of 20 meters, is mostly bedrock. Beyond

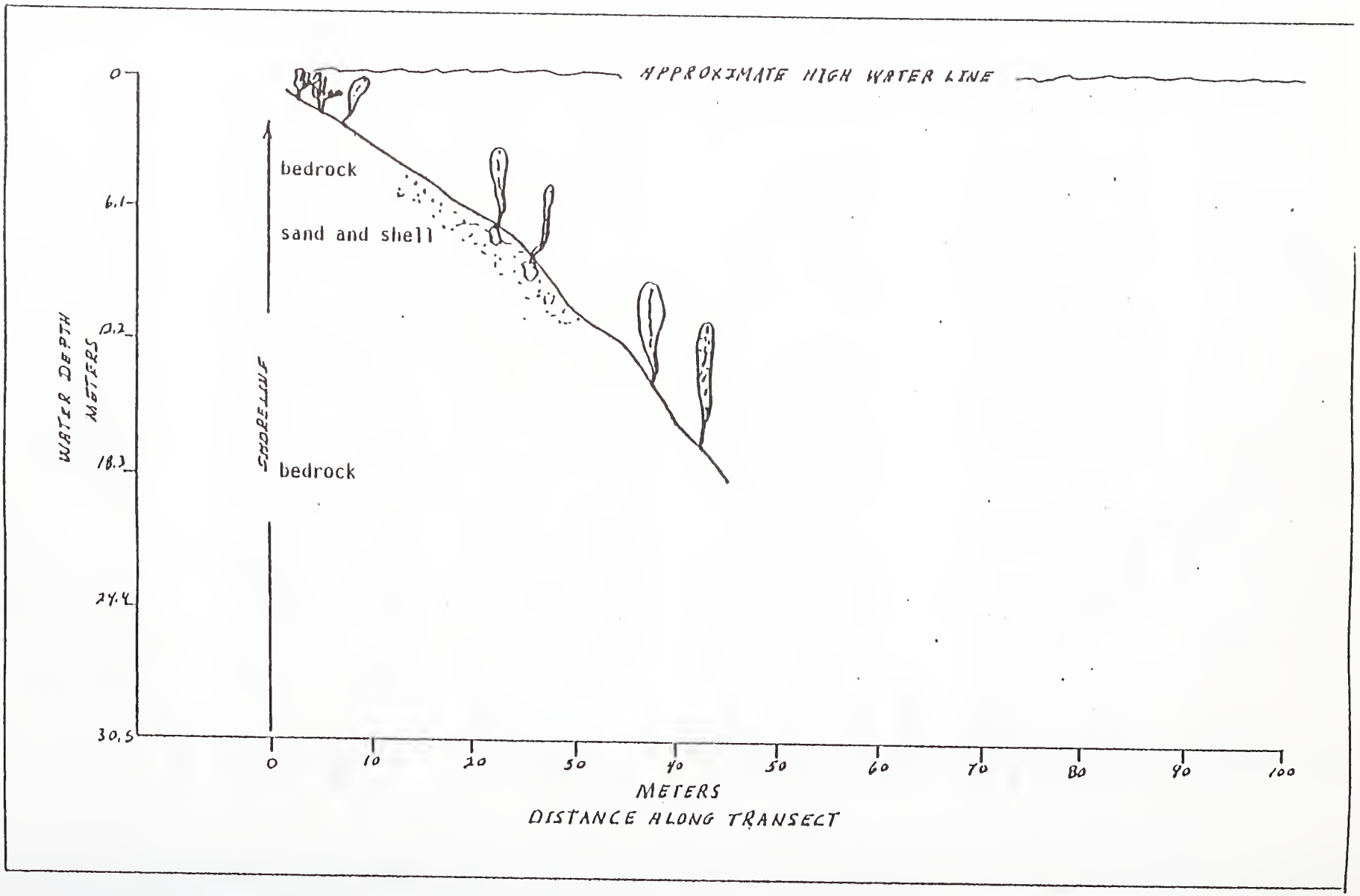


Figure 9. - Bottom profile, Site #8, Carroll Inlet.

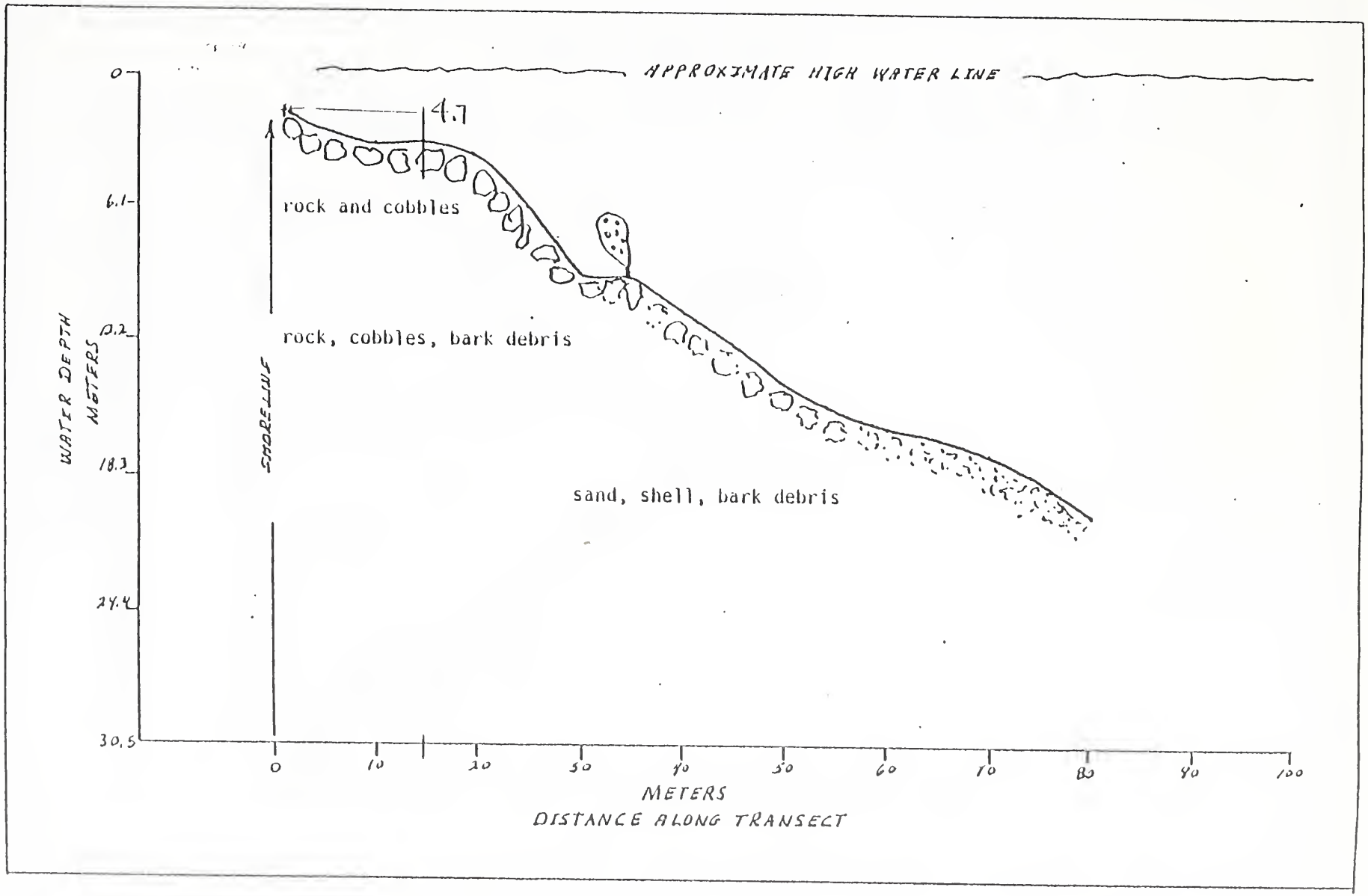


Figure 10. - Bottom profile, Shoal Cove, Carroll Inlet.

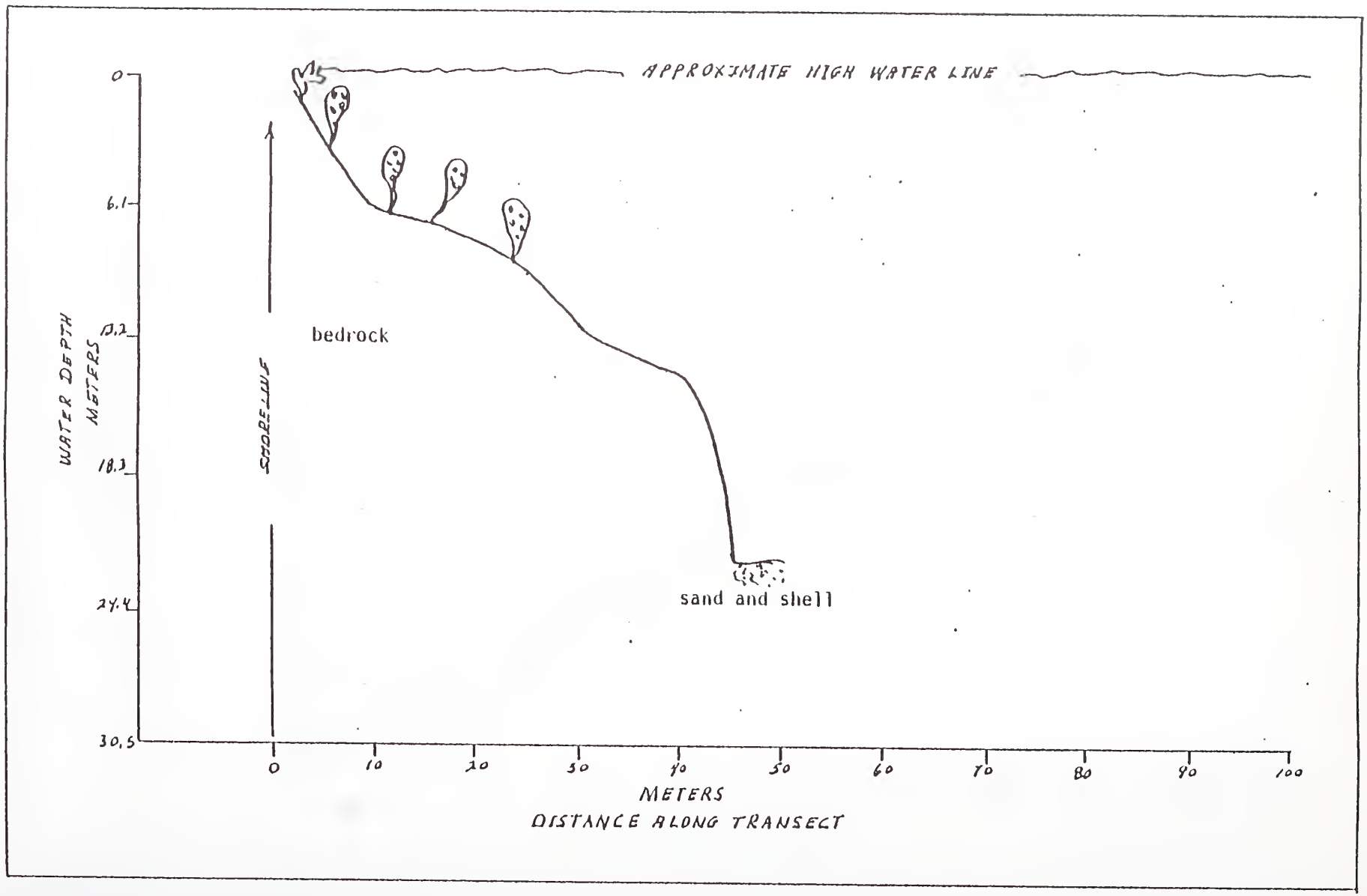


Figure 11. - Bottom profile, Site #6, Tokeen Bay.

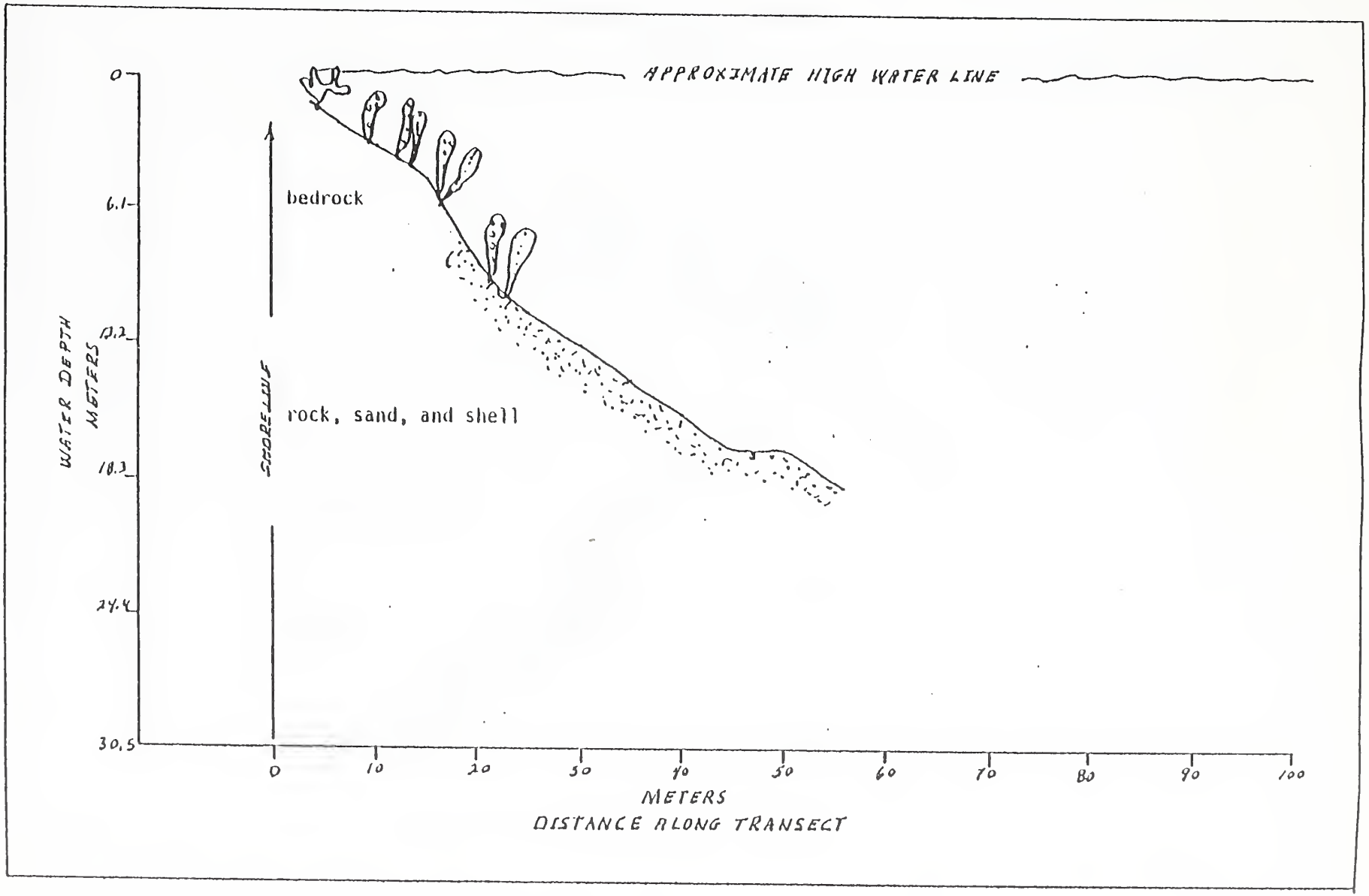


Figure 12. - Bottom profile, Site #5, Tokeen Bay.

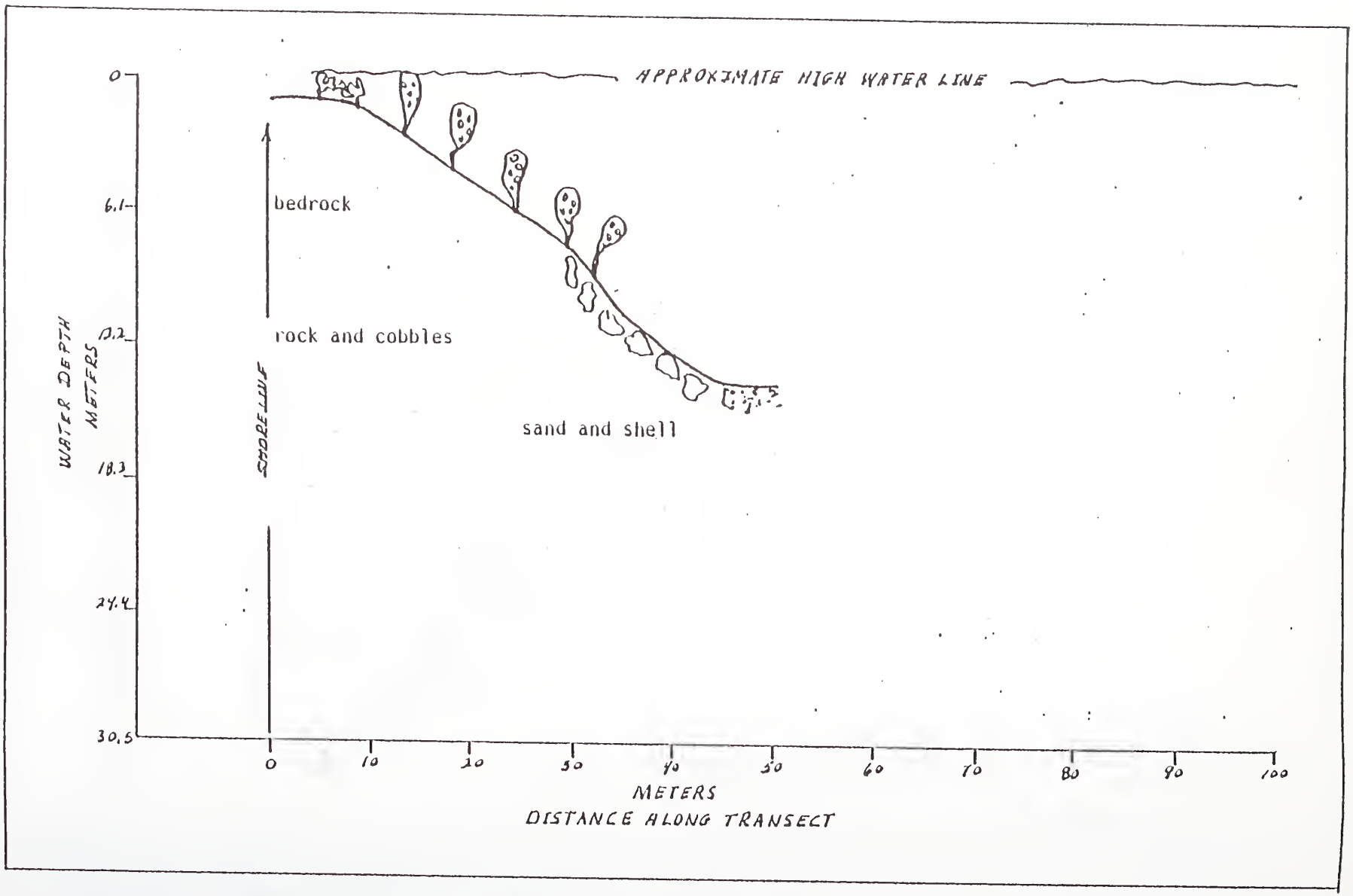


Figure 13. - Bottom profile Site #1, Tokeen Bay.

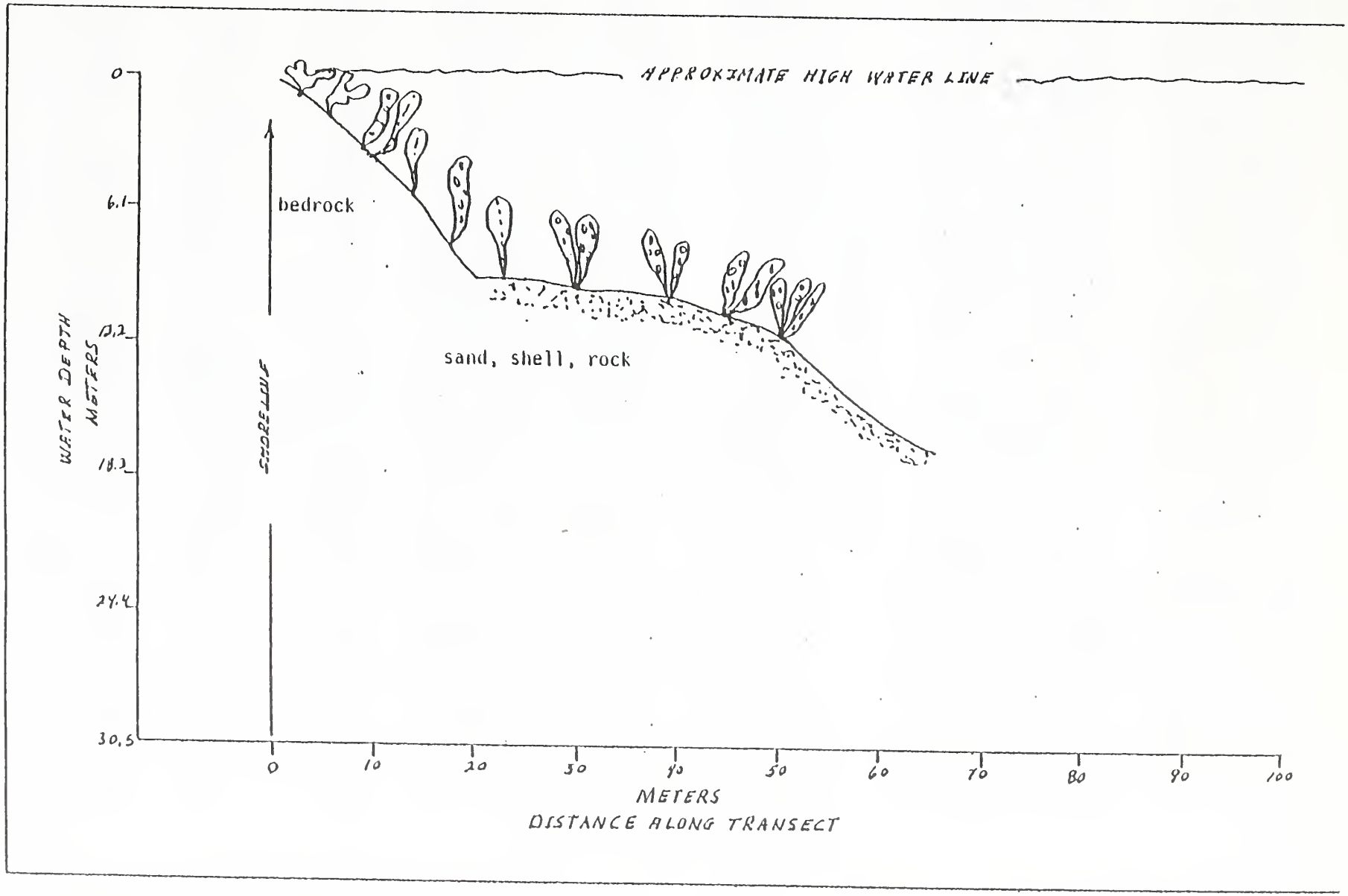


Figure 14. - Bottom profile Site #1, Shelikof Island.

20 meters, the substratum is composed of sand and shell with numerous rock out-croppings. Dense bands of macrophytic algae occur along the bedrock and rock out-croppings to a distance of 50 meters from shore; 80 to 90 percent of the area is covered by these algae. Animal species composition is diverse and numbers of organisms are abundant, especially in the vegetative zone, but become sparse at a depth of 13 meters, 50 meters from shore.

Site #3 - (Figure 15). Start of dive, 1110 hours; end of dive 1128 hours. The bottom drops moderately from shore along an average slope of 25 degrees to a distance of 50 meters from shore. Substratum, from shore to a distance of 15 meters, is bedrock. Beyond 15 meters, the substratum is composed of sand and shell with boulders. A moderately dense band of macrophytic algae occurs, from shore, to a distance of 35 meters. Animal species composition is diverse and numbers of organisms are abundant in the vegetative zone. Water depth was 18 meters, 50 meters from shore.

DISCUSSION AND CONCLUSIONS

Thorne Arm - Site #6 - Biological production in the vegetative zone is quite rich with respect to both species diversity and numbers of organisms. However, farther from shore this production decreases markedly. With the extensive vegetative zone and gentle slopes we do not recommend this site be used as a transfer facility.

Site #6A - Biologically, this site is similar to Site #6, however, with its steeper bottom slopes and less vegetated area, productivity would not be affected to the extent as that at Site #6. We would recommend Site #6A be considered for a log transfer facility in Thorne Arm.

Carroll Inlet - Site #4 - Biological production is relatively limited. Bark that accumulates should have minimal impact on the area's ecology. The point just north of the proposed site was sounded with a weight and line. The bottom slope is steeper and deeper water is closer to the shore. This would make the point better suited for the location of a transfer facility. However, either site could be used.

Site #7 - This is the location of an old transfer facility. Biological production is poor. Woody debris covers the substratum and an additional accumulation of bark debris would have minimal impacts on the area. This site could be used as a transfer location.

Site #8 - Biological production is limited to a few plants attached to rock surfaces. Animal species were few. The steeper bottom slopes should facilitate dispersal of woody debris into deeper and less productive waters. This site could be used as a transfer facility.

Shoal Cove - This site has been used as a transfer site. Woody debris covers the bottom for a distance of 75 meters from shore. Biological production is relatively limited. An additional accumulation of bark debris should have only minimal impacts on the local area. This site is suitable for a transfer facility.

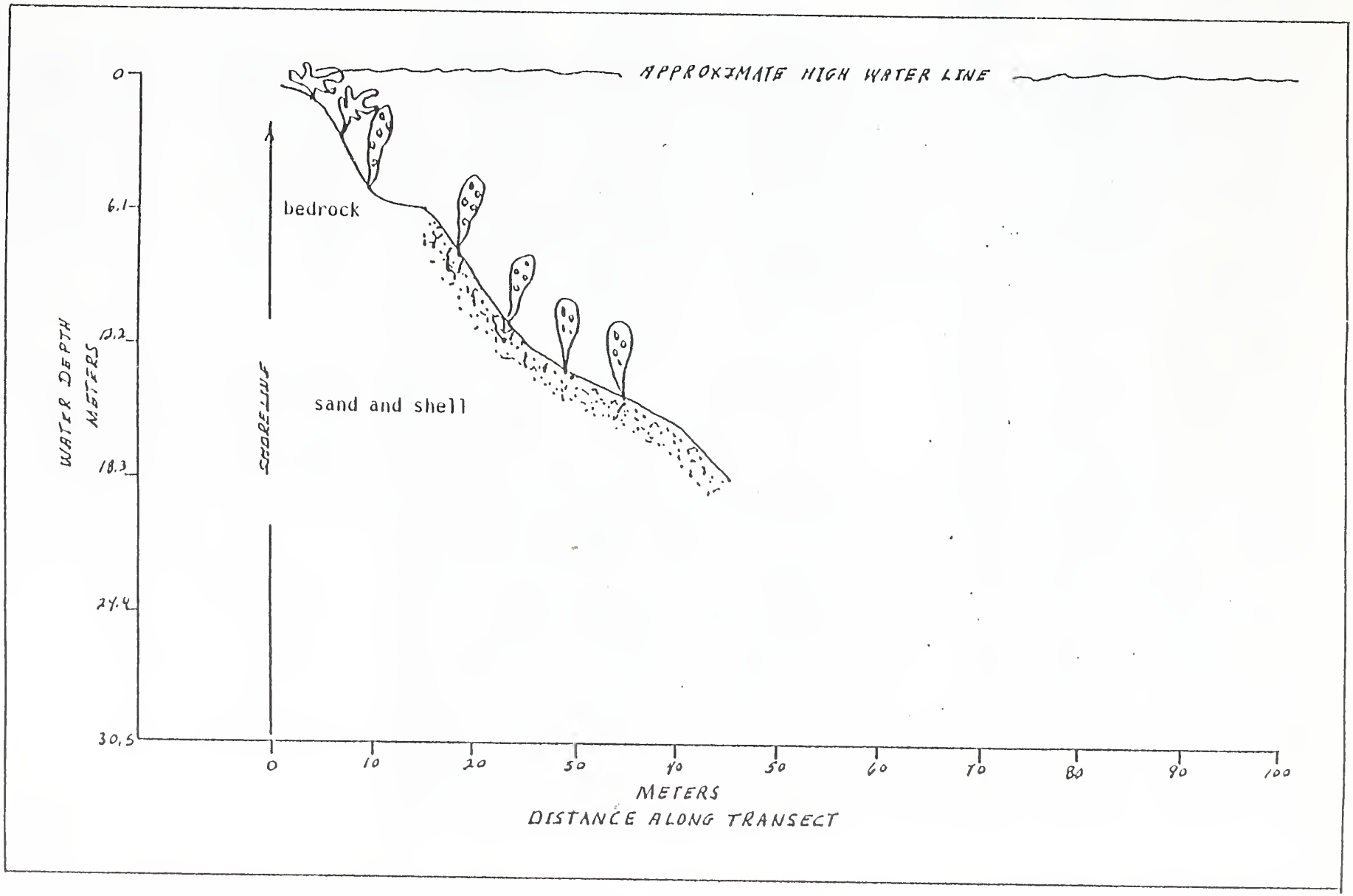


Figure 15. - Bottom profile Site #3, Shelikof Island.

Tokeen Bay - Site #6 - Biological production, near shore, is quite rich with respect to both species diversity and numbers of organisms. This site is also located on an island. Access to the site would require either a bridge or fill. A fill would cause additional impacts to the biological community if this site was developed. Construction of a transfer facility would not be recommended at this site even without the additional impacts associated with providing access to the island.

Site #5 - This site is moderately rich in the production of both plant and animal species. It is not, however, as productive as Site #6. This site is preferred for a log transfer location.

Site #1 - This site is moderately rich in both plant and animal species. Nearshore slope is similar to that of Site #5. This site could be used as a transfer location, however, we would recommend Site #5 over this location.

Shelikof Island

Site #1 - Biological production is very rich with respect to both species diversity and numbers of organisms. Further, the bottom is stepped with large expanses of flat area. Woody debris would be retained in the productive zone and significant adverse impacts would occur to existing productivity if this site was developed. This is not a good location for a transfer facility.

Site #3 - Biological production near shore is quite rich in both species diversity and numbers of organisms. However, farther from shore this production decreases. Steeper bottom slopes should facilitate dispersal of debris into deeper and less productive waters. This location is suitable for a transfer facility.

Proposed sites indicated as suitable for log transfer facilities are based on observations of estuarine ecology made during these investigations. It should be noted, however, that observations over time were not made and as a result, seasonal changes of productivity, including fish and shellfish spawning occurrences, were not observed. Our conclusions could change at a later date pending new information.

Table 1. List of Plant and Animal Species Observed During Field Investigations - July 18-21, 1983.

Thorne Arm - Site #6	- Plant Species -
Agarum cribrosum	Brown algae
Desmarestia intermedia	Brown algae
Fucus distichus	Rock weed
Lithothamnium spp.	Red algae
Rhodymenia palmata	Red algae
Ulva/Monostroma complex	Green algae
	- Animal Species -
Balanus spp.	Barnacle
Corella willmeriana	Glass tunicate
Dermasterias imbricata	Leather star
Evasterias troschelii	Molted star
Florometra serratissima	North Pacific crinoid
Henricia leviuscula	Blood star
Hexagrammos decagrammus	Kelp greenling
Limpet	Limpet
Metandrocarpa taylori	Red social tunicate
Membranipora spp.	Kelp bryozoan
Microporiana borealis	Jointed bryozoan
Mytilus edulis	Blue mussel
Pagurus setosus	Setose hermit crab
Parastichopus californicus	Mop sea cucumber
Ptilosarcus gurneyi	Sea pen
Pycnopodia helianthoides	Sunflower star
Rhacochilus vacca	Pile perch
Serpula vermicularia	Common serpulid
Snail	Snail
Telmessus cheiragonus	Horse crab

		Site Number			
Carroll Inlet	- Plant Species -	4	7	8	Shoal Cove
Agarum cribrosum	Brown algae			x	x
Constantinea simplex	Red algae	x		x	
Fucus distichus	Rock weed	x	x	x	
Laminaria spp.	Brown algae	x	x	x	
Rhodymenia palmata	Red algae			x	
Zostera marina	Eelgrass	x		x	
	- Animal Species -				
Balanus spp.	Barnacle	x	x	x	x
Boltenia villosa	Stalked hairy tunicate	x	x	x	
Cancer magister	Dungeness crab	x	x	x	
Cancer productus	Red rock crab	x			

Carroll Inlet (cont'd)	- Plant Species -	Site Number 4	7	8	Shoal Cove
Corella willmeriana	Glass tunicate				x
Crossaster papposus	Rose sun star				x
Dermasterias imbricata	Leather star	x			
Elassochirus tenuimanus	Hermit crab				x
Evasterias troschelii	Molted star	x	x		
Leptasterias hexactis	Six-armed star				x
Limpet	Limpet	x	x	x	
Mytilus edulis	Blue mussel	x	x	x	
Ophiopholus aculeata	Brittle star				x
Oregonia gracilis	Decorator crab	x			
Pagurus spp.	Hermit crab	x	x	x	
Parastichopus californicus	Mop sea cucumber	x		x	x
Pisaster brevispinus	Sea star	x			
Pisaster ochraceus	Ochre star			x	
Pycnopodia helianthoides	Sunflower star	x	x	x	x
Rhacochilus vacca	Pile perch	x	x	x	
Snail	Snail	x	x	x	
Strongylocentrolus droebachiensis	Green sea urchin				x
Tresus capax	Horse clam	x			

Tokeen Bay	- Plant Species -	Site 1	5	6
Agarum cribrosum	Brown algae	x	x	x
Constantinea simplex	Red algae		x	x
Desmarestia intermedia	Brown algae			x
Fucus distichus	Rock weed	x	x	x
Laminaria spp.	Brown algae	x	x	x
Lithothamnium spp.	Red algae	x	x	x
Rhodomela spp.	Red algae		x	x
Ulva/Monostroma complex	Green algae		x	x
	- Animal Species -			
Balanus spp.	Barnacle	x	x	x
Calliostoma annulatum	Ringed top shell			x
Chlamys spp.	Pink scallop			x
Cucumaria miniata	Orange sea cucumber			x
Dermasterias imbricata	Leather star	x	x	x
Halocynthia aurantium	Sea peach			x
Halocynthia igaboja	Hairy tunicate			x
Limpet	Limpet	x	x	x
Membranipora spp.	Kelp bryozoan	x	x	x
Microporina borealis	Jointed bryozoan	x	x	x
Parastichopus californicus	Mop sea cucumber	x	x	x
Pycnopodia helianthoides	Sunflower star	x	x	x

Tokeen Bay (cont'd)	- Animal Species -	Site 1	5	6
Rockfish	Rockfish			x
Schizobranchia insignis	Feather-duster worm			x
Serpula vermicularia	Common serpulid	x	x	x
Snail	Snail	x	x	x
Strongylocentrolus droebachiensis	Green sea urchin	x		
Terebratalia transversa	Common lamp shell			x
Tonicella lineata	Lined red chiton		x	

Shelikof Island	- Plant Species -	Site 1	3
Agarum cribrosum	Brown algae	x	x
Desmarestia intermedia	Brown algae	x	x
Fucus distichus	Rock weed	x	x
Halosaccion grandiforme	Red algae	x	
Laminaria spp.	Brown algae	x	
Lithothamnium spp.	Red algae	x	x
Rhodomela spp.	Red algae	x	x
	- Animal Species -		
Archidoris ohdeneri	White doris	x	x
Balanus spp.	Barnacle	x	x
Corella willmeriana	Glass tunicate		x
Cryptochiton stelleri	Gum boot chiton	x	
Cucumaria miniata	Orange sea cucumber	x	x
Dendronotus dalli	Dall's frond eolis	x	
Evasterias troschelii	Molted star		x
Halocynthia igaboja	Hairy tunicate	x	x
Mediaster aequalis	Vermillion star	x	x
Eupentacta quinquesemita	White sea cucumber		x
Metandrocarpa taylori	Red social tunicate		x
Membranipora spp.	Kelp bryozoan	x	x
Metridium senile	Fine-tentacled sea anemone	x	
Mytilus edulis	Blue mussel	x	
Pachycerianthus fimbriatus	Tube anemone	x	x
Pagurus spp.	Hermit crab	x	
Parastichopus californicus	Mop sea cucumber	x	x
Pisaster brevispinus	Sea star		x
Pisaster ochraceus	Ochre star	x	x
Pycnopodia helianthoides	Sunflower star	x	x
Serpula vermicularia	Common serpulid	x	x
Snail	Snail	x	x
Strongylocentrotus franciscanus	Red sea urchin	x	

ALASKA TIMBER TASK FORCE

SITING GUIDELINES

LOG TRANSFER SITE EVALUATION

Log transfer sites were selected and evaluated with respect to the interagency Log Transfer Siting Guidelines. Following are the siting guidelines used to evaluate both new and existing Log Transfer Sites.

SITING GUIDELINES

Proximity to Rearing and Spawning Areas: Siting of log storage and transfer facilities within 300 feet of mouths of anadromous fish streams or in areas known to be important for fish spawning or rearing is normally prohibited.

Protected Locations: Log transfer and log raft storage facilities should be sited in weather protected waters with bottoms suitable for anchoring and at least 20 acres for temporary log storage and booming.

Upland Facility Requirements: Log transfer facilities should be sited near at least five acres of relatively flat uplands. There should also be a body of water sufficient to provide a minimum of 60 linear foot facility face.

Safe Access to a Facility From the Uplands: To provide safe access to the log transfer facility and adjoining log sort yard, the facility should be sited where access roads can maintain a grade of 10 percent or less for trucks and four percent specialized equipment.

Bark Dispersal: Log transfer facilities should be sited along or adjacent to straits and channels or deep bays where currents may be strong enough to disperse sunken or floating wood debris. Siting log transfer facilities in embankments with sills or other natural restrictions to tidal exchange should be avoided.

Site Productivity: Sites for in-water storage and/or transfer of logs should be located in areas having the least productive inter-tidal and sub-tidal zones.

Sensitive Habitats: Log transfer facilities and log raft storage areas should not be sited on or adjacent to extensive tide flats, flat marshes, kelp, or eel grass beds, seaweed harvest areas, or shellfish concentration areas.

Safe Marine Access to Facilities: Log rafting and storage facilities should be accessible to tug boats with log rafts at most tides and on most days.

Storage and Rafting: Logs, log bundles, or log rafts should be stored in areas where they will not ground at low tide. A minimum depth of forty feet or deeper, measured at mean lower low water (MLLW), for log raft storage is preferred.

Avoid Bald Eagle Nest Trees: Site log transfer facilities to avoid Bald eagle nests. No project construction or operations should be closer than 330 feet to any Bald Eagle nest tree.

Additional interagency guidelines concerning LTF site construction and monitoring are included in Appendix E.

Existing sites were examined in accordance with the interagency siting guidelines to evaluate current adequacy. The existing sites do not necessarily meet all guides. For instance, several sites within the Project Area may be located within 300 feet of an anadromous fish stream.

An additional log transfer siting guideline dealing with recreation and visual considerations is as follows: log transfer facilities should be located where conflicts with existing boat anchorages will be minimized and views of the facility will be considered as seen from travel routes and use areas.

EVALUATION OF LOG TRANSFER FACILITIES
Using 404(b)(1) Guidelines of the Clean Water Act

UPPER CARROLL PROJECT

US Forest Service
Tongass National Forest
Ketchikan Area
Ketchikan Alaska

Sept.12, 1995

CONTENTS

Project area Map.....ii

404(b)(1) Guidelines of the Clean Water Act.....1

Reactivation of Carroll Inlet LTF #7.....1

Proposed Upper Carroll Site #8.....16

Helicopter Transfer Sites #1 & #2 13

Connect Neets Bay LTF #15 to Shrimp Bay LTF #5.....29

Foot Notes.....56

ATTACHMENTS

A. Project Area Log Transfer Sites
B. Carroll Inlet LTF sites
C. Neets Bay LTF sites
D.

EVALUATION OF LOG TRANSFER FACILITIES
Using 404(b)(1) Guidelines of the Clean Water Act.

Guidelines governing siting, construction, operation and monitoring of log transfer facilities (LTF) under 40 CFR 230.12(a)(3)read as follows:

> V. Log Transfer Facilities Siting, Construction, Operation, and Monitoring
> A. Site log transfer facilities in locations which will best avoid or minimize potential impacts on water quality, aquatic habitat and other resources. During site analysis, cooperate with State and Federal agencies per stipulations in Memoranda of Understanding or cooperative agreements to assemble required data and evaluate alternatives.
>
> Evaluate alternatives using the 404(b)(1) guidelines to determine if "(i) There is a practicable alternative to the proposed discharge that would have less adverse effect on the aquatic ecosystem, so long as such alternative does not have other significant adverse environmental consequences; or (ii) The proposed discharge will result in significant degradation of the ecosystem; or (iii) The proposed discharge does not include all appropriate and practicable measures to minimize potential harm to the aquatic ecosystem; or (iv) There does exist sufficient information to make a reasoned judgement as to whether the proposed discharge will comply with these guidelines.

Log transfer facilities under the various action alternatives for the Upper Carroll project were evaluated on the basis of items i through iv noted above. That evaluation is presented in subsequent discussions.

Specific Log Transfer (LTF) site locations are contained in Attachments A through D.

REACTIVATION OF UPPER CARROLL INLET LTF #7

> Includes modifying the existing LTF to a Single A-Frame lift-off system with bulkhead and guide rails.

Evaluation of Alternatives.

Determine if; **(i) There is a practicable alternative to the proposed discharge that would have less adverse effect on the aquatic ecosystem, so long as such alternative does not have other significant adverse environmental consequences.**

Description:

Upper Carroll Inlet contains one existing LTF (#7) that will require reactivation or relocation. The relocation site (#8) is aproximately 1000 feet south of the present site along Carroll Inlet. Only one of the two proposed sites will be required for the project.

Upper Carroll Inlet project area contains 5,654 acres of harvestable timber, of which approximately 2400 acres are proposed for harvest.

Alternatives to reactivation of Upper Carroll Inlet LTF(#7):

No action alternative: No harvest of timber resources in Carroll inlet

Relocate LTF

Construct road connections to existing, active LTF's.

Sub-alternatives to the proposed LTF modification.

Dry land transfer from bulkhead to barge[4]

Chain Slide system.

Low-angle ramp

Other alternatives not demonstrated as practicable were not considered any further. For example; pile supported bridge ramp and barge or special slide out ramps etc.[4]

Evaluation between alternatives

No Action: The No Action alternative would eliminate the need for an LTF, thus producing no discharge of any pollutants. Accordingly, access to 5654 acres of timber resources would be forgone.

Relocate LTF: Relocation of the LTF to Upper Carroll Inlet Site #8 would create new impacts to an undisturbed portion of the aquatic habitat. Haul and fuel use would be more than that of the existing site. The cost of site #8 would be $250,000, the same as the reconstruction of the existing site, and additional 1000 feet of new constrution road will be needed to access site #8. Additional cost in haul and construction would be about $11,500 and $80,000 respectively. Site #8 would be developed as a Single A-frame lift-off type system.

Another relocation site(#4) was also considered. This site is located 3 miles south of site #7 on the east side of Carroll Inlet. The cost of developing site #4 would be $250,000, the same as the existing site. Additional cost in haul and construction would be $105,000 and $1,100,000 respectively. Access construction to this site would

require constructing a road between the Swan Lake dam and the shoreline. This would require significant construction and blasting in the proximity of the dam and associated powerhouse facilities, risk of damage to the facilities would need to be evaluated prior to selecting this option. This would disturb 27 acres of productive lands.

Reactivate Existing LTF: (Preferred Alternative) Reactivation of the existing LTF includes modification of the existing steep slide to a single A-Frame system. This will require extension of the fill, and installation of a bulkhead and guide rails. The extension of the fill may increase the existing footprint by 0.1 acre in the aquatic habitat.

Impacts to the aquatic habitat would be retained in a previously impacted area. Haul and fuel use would be slightly lower than for site #8.

Construct Road Connections to Existing, Active LTF's: Road connections to existing LTF's at Shelter Cove, Shoal Cove, Traitors/Fire Cove and Shrimp Bay are feasible. The connection to Shelter Cove would require and additional 7 miles of road to be constructed over a route that has very steep side slopes and would reqire numerous difficult stream crossing along the existing Ketchikan to Swan Lake powerline. This would distrub 63 acres of productive land. Estimated cost is $5-6 million. The connection to Shoal Cove is on similar type of ground requiring 8.5 miles of new construction to tie into the existing road system that is approximately 10 miles from the LTF at Shoal Cove. There would be numerous difficult stream crossings which includes the Swan Lake outfall. This would disturb 78 acres of productive land. Estimated cost is $4 million. Visual impacts of these two routes would be high due to having to parallel the shoreline on both routes. The road connection to the Traitors Creek drainage which connect to the Fire Cove LTF, would require approximately 4 miles of road construction across mostly oversteepened slopes on high mass movement soils. Feasibility of this route is questionable. This would disturb 36 acres of productive land. Estimated cost is $2.5 million. The road connection to Shrimp Bay from Carroll Inlet is feasible and is assummed to be constructed for the maximum timber alternative in the EIS. Assuming all roads were constructed, the additional costs would be the haul and fuel costs. With the bulk of the timber resources in the Carroll Creek drainage the haul and fuel costs would increase $596,000 over transferring the logs at Carroll Inlet.

Sub-alternatives to the proposed LTF modification

Dry Land Bulkhead to Barge Transfer: Modification of the existing site for barge loading would require construction of a 3 to 5 acre sort yard, relocation of the access road, and expansion of the existing fill with bulkhead to deep water.

The barge system will effect 4 to 6 acres of forested wetlands, 0.2 acres of fill in aquatic habitat and cost approximately $1,000,000. Haul and fuel use would be about the same as

modification of the existing site to an A-frame system.

Chain Slide System: Modification to a chain slide would require relocation of the access road, removal of most of the existing fill and expansion of the upland operating area due to loss of the fill area. This would effect about 1.5 acres of forested wetlands and about 0.2 acres of aquatic habitat associated with fill and slide structure. Road and LTF construction costs would be about $627,000. Fuel use and haul would be the same as the proposed action.

Low-Angle Ramp: Modification to a low-angle ramp may be possible and will be analyzed with existing surveys. Effects on the aquatic habitat would be the same as the proposed action. Road, LTF, fuel use and haul would be the same as the proposed action.

Determine if; **(ii) The proposed discharge will result in significant degradation of the aquatic ecosystem**

Carroll Inlet #7 is an existing site that has moderate bathymetric characteristics with strong tidal currents that will provide good flushing characteristics.

The proposed single A-Frame system is capable of transferring logs at entry velocities of 3ft/sec and less. This capability will minimize discharge of bark into the aquatic ecosystem.

Surface runoff into the aquatic ecosystem will be kept to a minimum by insloping the road and LTF surface, collecting and settling runoff, and periodic surface cleanup of bark and woody debris. (40CFR 122.27 Silvicultural Point Sources; applicable to State NPDES programs,see 40 CFR 123.25).

Determine if; **(iii) The proposed discharge does not include all appropriate and practicable measures to minimize potential harm to the aquatic ecosystem**

The existing site will adapt to a single A-Frame system with the least amount of impacts to both the uplands and aquatic ecosystem. The single A-Frame system is capable of controlling entry velocities to 3ft/sec and under.

Surface runoff into the aquatic ecosystem will be kept to a minimum by insloping the road and LTF surface, collecting and settling runoff, and periodic surface cleanup of bark and woody debris. (40CFR 122.27 Silvicultural Point Sources; applicable to State NPDES programs,see 40 CFR 123.25).

The National Marine Fisheries Service and U.S. Fish and Wildlife Service recommended using the existing site. See attached National Marine Fisheries and US Fish and Wildlife agencies report.

The reconstruction of the existing site into a single A-Frame and bulkhead or low-angle ramp is preferred to relocation or modification into other systems.

A low-angle ramp would be most economical for such intermittent operations if the site would accommodate the ramp. The next most economical method is the single A-Frame system.

HELICOPTER TRANSFER SITES # 1, # 2 (Neets Bay and Carroll Inlet)

Includes flying logs from the harvest area directly to a barge. See Attachment C.

Evaluation of Alternatives.

Determine if; **(i) There is a practicable alternative to the proposed discharge that would have less adverse effect on the aquatic ecosystem, so long as such alternative does not have other significant adverse environmental consequences.**

Description:

Helicopter transport of logs from the harvest area directly to a barge eliminates need for constructing roads on steep ground.

Several small areas tributary to Neets Bay and Carroll Inlet are located adjacent to the west side of Carroll Inlet and the northeast side of Neets Bay.

The tributary areas contains 600 acres of harvestable timber, of which 266 acres are proposed for harvest. This equates to 6MMBF of timber to be harvested.

Alternatives to the proposed Helicopter Transfer System.

No action alternative: No harvest of timber resources in the tributary areas.

Connect isolated harvest areas to existing Shrimp Bay and Shelter Cove LTF sites.

Sub-alternatives to the proposed helicopter to barge transfer.

Flat raft to Shrimp Bay or Shelter Cove LTF sites.

Evaluation between alternatives

No Action: The No-Action alternative would eliminate the need for reactivating the LTF, thus producing no discharge of any pollutants. Accordingly, access to 600 acres of timber resources would be forgone.

Helicopter Transfer: (Preferred Alternative) Helicopter transport

directly to a barge will eliminate use of any fill in the aquatic ecosystem.

Connect isolated Neets Bay areas to Shrimp Bay LTF and Carroll Inlet areas to the Shelter Cove LTF. Connecting to Shrimp Bay would require 3 miles of road on excessively steep side slopes. The route would; cross numerous existing slide areas, have massive rock cuts, and very steep adverse haul grades making haul practicability marginal. A connection to Shrimp Bay would cost $1,200,000 and would disturb about 27 acres of productive land. Numerous mass failures would be expected. This alternative would increase fuel use and haul costs $37,000. The total additional construction costs for connecting to, and using Shrimp Bay LTF would be about $1,492,000 more than helicopter transfer. From a visual standpoint, high impacts would be expected due to massive full bench cuts and mass failures.

Connecting the Carroll Inlet area to Shelter Cove would require 2.5 miles of road on steep side slopes, across high mass movement soils. The route would; cross the existing powerline corridor, require crossing of anadroumous streams. A connection to Shelter Cove would cost $750,000 and would disturb about 23 acres of productive land. This alternative would increase fuel use and haul costs $11,000. The total additional construction costs for connecting to, and using Shelter Cove LTF would be about $800,000 more than helicopter transfer. From a visual standpoint, high impacts would be expected due to full bench cuts and possible mass failures.

Sub-alternatives to the proposed transfer system.

Flat Raft to Shrimp Bay LTF or Shelter Cove LTF: Logs would be flown directly to water and placed in a flat raft. The logs would be towed to Shrimp Bay or Shelter Cove LTF sites, dewatered, delimbed, sorted, bundled, rewatered, rafted and towed to manufacturing centers. This would require extensive modification of either of the LTF sites for moving logs from the flat raft to the uplands for sorting. Due to the need for extensive modification of the LTF sites and limited potential for development of a sort yard, this alternative was not considered further.

Determine if; **(ii) The proposed discharge will result in significant degradation of the aquatic ecosystem**

Helicopter transfer of logs from the harvest area directly to a barge minimizes impacting the shallow high value marine habitat near the shoreline. The need for fill in the aquatic ecosystem is eliminated by using this system.

Landing logs on a barge will eliminate discharge of bark into the aquatic ecosystem. Periodic cleaning of the barge deck would minimize surface runoff into the aquatic ecosystem.

Determine if; **(iii) The proposed discharge does not include all appropriate and practicable measures to minimize potential harm to the aquatic ecosystem**

The Helicopter transfer system will create the least amount of impacts to both the uplands and aquatic ecosystem. The need for filling in aquatic habitat and surface runoff control is eliminated by use of this system.

The use of helicopter transfer for the isolated Neets Bay and Carroll Inlet harvest areas is preferable to developing a land LTF or connecting to other LTF sites as it will minimize both upland and aquatic ecosystem impacts and costs. Development of roads and the LTF would be uneconomical for the amount of timber volume being harvested at this area.

Surface runoff into the aquatic ecosystem will be kept to a minimum by periodically cleaning the barge deck of bark and woody debris.

FOOT NOTES

1 Verified by aerial photos and maps. Beach road with full bench rock cuts.

2 Verified by aerial photos and maps. Full bench road on steep mountain side with slides or potential mass movement. Suggests limited feasibility.

3 Verified by aerial and on the ground reconnaissance.

4 Subsurface investigation to determine engineering feasibility of foundation requirements has not been made. Feasibility is estimated based on on-site surface characteristics and conditions.

CARROLL CREEK LOG TRANSFER SITE SELECTION

PURPOSE FOR SITE SELECTION ANALYSIS

Commencement of the various permit application processes requires a decision on what specific site is needed. Accordingly, it is necessary to confirm a decision on the type and location for a Log Transfer Facility desired for the Upper Carroll EIS.

On 1/17/96 a meeting was held to decide upon which site and location was desired. Participants in the meeting were as follows:

Jim Deherrera	Ketchikan District Ranger
Bill Nightingale	Project IDT Leader
Jack Oien	Transportation Planner
Jim Rhodes	Transportation Engineer

The Ketchikan District Ranger decided to select the Low Angle Ramp at Carroll Cr. Site 1. The decision was based on recommendations which are presented in subsequent discussions.

SITUATION DESCRIPTION

Numerous Log transfer sites were considered for serving the UPPER CARROLL project area. The Draft EIS portrays the numerous options available. The most economic option is utilization of the existing LTF site at the head of Carroll Inlet.

There are two other possible sites within a mile of the Carroll Creek site that could serve the area. One has been considered in detail in the draft EIS and the other was not considered further due to other uses. The sites within close proximity are existing Carroll LTF, a new site 2,000' south of the existing site and a site at the Swan Lake hydropower plant 5,000' south of the existing site. The Swan Lake site was not considered further due to incompatibility of the log transfer and power system operations at the same site.

See the attached map portraying the three sites and their associated rafting areas.

The area served by the Carroll Cr. LTF will require accommodating small intermittent operations over the 100 year timber rotation period. Additionally, eventual power line access may be served by the LTF as an equipment supply and off loading point for power line development and maintenance.

The Carroll Cr. area is used by subsistence users, hunters, hikers, fishermen etc.

The Upper Carroll Cr. area is a possible corridor for the "Ketchikan to Bradfield Road Corridor" being considered by the State of Alaska. Should this route be developed, log transfer facilities in the area would be connected, resulting in additional uses for the LTF sites.

ANALYSIS AND RECOMMENDATIONS

EXISTING CARROLL LTF (SITE 1):

The existing site is at the head of Carroll Inlet on the east side. The site could be developed as an A-Frame, Low Angle Ramp or Log Barge Loading log transfer system.

This site has been impacted previously due to harvest activities during the 1960s.

The rafting area for the Carroll Cr. site lies in depths of 40 to 100' beginning 400' south of the site and running to the A-Frame site (Site 2).

The existing site will not require any additional road construction other than that to reach new timber harvest areas.

A-Frame System:

If developed as an A-Frame system, a large fill will be needed to provide the required operating area and water depths. According to preliminary designs, the operating area will be about 120' by 120' with a log crib around two sides. The fill will be about 8,700 cy of shot rock and the foot print will be 0.4 acre in the marine environment. Preliminary projections in the EIS portrayed a larger foot print.

An A-Frame site will cost $200,000, create a large fill in the marine environment and create a high maintenance structure. The effective life of a log bulk head is about 10 years. Bulkhead replacement will needed at 10 to 15 year intervals which would cause disturbance during the reconstruction phase. This system will not accommodate small intermittent operations. Only the large operators would have the machinery to use such a site.

From a visual impact standpoint, the large fill in the waterway would create a significant impact.

Low Angle Ramp:

The Low Angle ramp will consist of a shot rock fill that will require minimal surface maintenance over a very long structural life. The fill will consist of 1,000 cy of rock. The foot print will be 0.2 acre in the marine habitat.

This facility will cost $80,000. The ramp will accommodate small intermittent operations and small operators. Both small and large operators generally have a rubber tired log loader for this application.

An upland operating area of 120' by 120' will be needed. This will disturb 0.4 acre of upland area.

This log transfer system will have the lowest profile and smallest fill which will minimize the visual impacts.

Log Barge Loading System:

A log barge loading facility would require an 300' causeway fill and bulkhead to reach adequate depths for deep draft log barges. Maintenance would be extremely high over time and initial costs would be about $400,000 to $500,000. The log crib wall will need to be replaced at 10 to 15 year intervals. Such systems are cost prohibitive for small intermittent operations. The fill will cover 0.3 acre of marine habitat.

The log barge loading facility would require a large upland log storage area which is not available without extensive excavation on steep terrain or additional filling on the tide flat which would impact an additional 1.0 acre of marine habitat.

The large upland operating area and extensive causeway type fill will have a high visual impact.

The Carroll Cr. site is not a good site for log barge loading due to the terrain, bathymetry, and physical orientation.

Recommendation:

Use of a 15% barge ramp was selected for the following reasons:

- Extreme low maintenance
- Small foot print in marine habitat
- Low initial cost of about $80,000
- Meets needs for subsequent intermittent operations
- Low upland foot print and impacts
- Least visual impact
- Structure will facilitate equipment off loading and staging for power line construction
- Serve as a landing for recreation users, such as hunters, boaters, etc.
- Serve as a boat launch in the future if the Ketchikan to Bradfield road were developed
- Site has been impacted previously and considered usable by US Fish & Wildlife Service and National Marine Fisheries Service habitat assessment biologists.

A-FRAME LTF SITE (SITE 2)

This site is 2000' south of Carroll Cr. Site 1. A road will need to be extended to the site. The route lies on excessively steep side slopes adjacent to the shoreline of Carroll Inlet. Additionally, the LTF site has relatively steep side slopes

This site has not been impacted by any previous harvest activities. The bathymetry is favorable for an A-Frame system or barge loading facility and most unfavorable for a Low Angle Ramp system. The upland terrain is marginally suitable for an A-Frame system and highly unsuitable for a log barge loading facility.

The rafting area would be in the same location as for Site 1.

A-Frame System:

This site has a steep rock beach and excellent water depths. Approximately 200 lin. ft. of log bulkhead will be required. The fill will consist of 3,300 cy of shot rock.

An upland operating area 120' by 150' will be needed. The upland side slopes are steep which will require excavation of 14,000 cy of material. Development will cost $250,000. The log bulkhead will need to be replaced at 10 to 15 year cycles.

The fill will displace 0.2 acre of marine habitat and the upland development will impact 0.6 acre of upland area.

The rock cuts will be 40 to 60' high which will be highly visible from water borne traffic.

This system will not accommodate small intermittent operations due to the high cost of an A-Frame system.

Extension of the road will cost approximately $200,000. The road will be directly adjacent to the shoreline of Carroll Inlet.

Low Angle Ramp System:

The site is completely unfavorable for development. The bathymetry and upland terrain characteristics are too steep for development of a low angle ramp.

Log Barge Loading System:

A barge loading facility will require a fill and bulkhead consisting of 200 lin. ft. of log bulkhead and 3,100 cy of shot rock. This will remove 0.2 acre of marine habitat.

Barge loading facilities require a small sort yard area which will require 40,000 cy of excavation Development costs including extension of the road will be $588,000. A minimum of 0.9 acre of upland area will be impacted.

The back wall cuts for the sort yard will be highly visible from the water way.

This site would not accommodate intermittent use for small future operations.

Recommendations:

If this site is used, it is recommended that an A-Frame configuration be used. However, this site was rejected due to the following:

High maintenance
High initial cost of $200,000 to $588,000
High upland impacts
High visual impacts by the facility and road extension
Does not accommodate small future intermittent operations
Will not serve as a future boat ramp if the Ketchikan to Bradfield road were developed.
Site has not been impacted, however was found to be acceptable for use by the Fish & Wildlife Service and the National Marine Fisheries Service habitat assessment biologists
Structures are more limited for use in off loading and staging for power line construction

SWAN LAKE SITE (SITE 3):

The existing facility includes a barge off loading pad with bulkhead, a small boat and airplane dock and a boat launch or landing ramp.

The upland area includes an equipment shop, three residences with yards, bunk house, hydropower plant and other facilities.

Approximately 1.5 acres are available as staging area for various hydropower operation and maintenance actions.

Transfer of logs at the Swan Lake site will require expansion or reconfiguration of the bulkhead and pad to seaward, removal or relocation of the small boat dock and use of the 1.5 acre staging area. The bulkhead and pad accommodate shallow draft equipment barges. Accordingly, the facility will require expansion to accommodate deep draft log barges or A-Frame transferring rigs. The small boat dock may need removal to clear the area to accommodate the docking and moving of the log barge.

The existing landing ramp would require more clearance for handling log bundles.

Handling of logs in the staging area will interfere with normal hydropower operation and maintenance activities. Additionally, the proximity of the residential area may bring about a safety hazard for public and power plant personnel access.

A tide flat is located directly south of the site, accordingly, a rafting site will be needed immediately north of the site. This will displace the Fish Hatchery fish pens that are anchored in the vicinity each season.

The site is located adjacent to a tide flat at the mouth of Falls Cr. possibly presenting navigation hazards for deep draft barge handling.

Use of the Swan Lake area will require extension of the road from Carroll Cr. Site 1. This will include 1.0 mile of additional road. Costs were not developed for this alternative.

Recommendation:

Avoid use of the Swan Lake Site 3 due to the following:

- Safety concerns for public and hydropower employee access
- Concurrent log transfer and hydropower operations will interfere with each other
- Extensive reconfiguration and relocation of facilities is undesirable
- Proximity of residential area is undesirable and unsafe.
- Fish hatchery fish pens will require relocation
- Navigation hazards associated with proximity of shallow tide flat is undesirable



CARROLL CREEK LOG TRANSFER
SITE SELECTION

Scale: 1" = 1 mile

Appendix H

Silviculture Diagnosis

SILVICULTURE DIAGNOSIS
FOR
UPPER CARROLL EIS

The first step in the selection of an appropriate silvicultural system for an individual site is the diagnosis. After examination of the pertinent data (tree species, plant association, windthrow risk, stocking, elevation, aspect, soil type, productivity, etc.) a range of acceptable treatments (including defered entry) is prescribed. Treatments considered include such things as site preparation, planting, surveys, precommercial thinning, prunning, commercial thinning, and regeneration harvests. Due to the fact that most sites in SE Alaska are composed of overmature stands the range of treatments is usually limited to regeneration harvests or defered entry.

Regeneration harvest methods include even-aged (clearcut, shelterwood and seed tree) and uneven-aged (individual tree selection and group tree selection). Factors other than the silvical or ecological limitations of the species weigh heavily in the choice between regeneration harvest methods. These include economic considerations, other resource values, terrain considerations with its limitations on logging systems, and other operational environmental considerations such as the presence or absence of dwarf mistletoe, susceptibilty to windthrow, and susceptibility to logging damage. Therefore an acceptable treatment is one that is feasible and will achieve sound silvicultural objectives. Silvicultural objectives include species composition, stand condition class, growth rate, density, insect and disease control, and stand development over time.

The interdisciplinary team (IDT) has utilized the Forest Plan, management concerns and public issues to determine specific obejectives for the site. The IDT can select the silvicultural system that best meets the objectives or the defered entry (no action) can be selected for any or all sites. In order to meet the issues and concerns reflected in the various alternatives, one or more silvicultural systems may be selected for the same site depending upon the alternative. A detailed silvicultural prescription will be prepared for each unit within the selected alternative identified in the Record of Decision prior to final unit layout.

The following section describes the information and codes displayed in the diagnosis.

SILVICULTURE DIAGNOSIS - ALTERNATIVE #X — PAGE _ OF __

VCU	HAU RN VI EI ST T#	L U D RL EU VD	V O L C4	V O L C5	V O L C6	V O L C7	TOTAL ACRES	VOLUME MMBF	ASPECT	SLO P VQO	S L O E	MIN ELEV	MAX ELEV	T WH IR NO DW	SMU	ECO CODE	M M I	M C G	I SN ID TE EX	WET HAB	R I PH AA RB	M LE AE OT GH	HM RT VH	PROPOSED FUTURE MANAGEMENT
1	2	3 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

1< VCU or Value Comparison Unit. Used to subdivide Management Areas (K32 and K35) and are generally equivelent to third order watersheds.

2< Harvest Unit Number. A three digit number that represents a configuration or grouping of settings.

3< LUD or Land Use Designation. Land use allocation assigned through TLMP (1979,as ammended).

4< REV LUD - Land Use Designation or Management Prescription proposed under Alternative 3 of the Revised TLMP Draft Revision (1996a).

5< Volume Class 4 stand acres consisting of 8-20 MBF/Ac

6< Volume Class 5 stand acres consisting of 20-30 MBF/AC

7< Volume Class 6 stand acres consisting of 30-50 MBF/AC

8< Volume Class 7 stand acres consisting of 50 + MBF/Ac

9< Total Acres within the setting and summarized by Harvest Unit#. Alternative total is also displayed

10<Volume of each setting and summarized by Harvest Unit#. Volume is displayed in MBF (Thousand Board Feet)

11<Aspect is the predominent direction the slope faces (North,East,South or West)

12<Visual Quality Objective based on the proposed Alternative 3 LUD's and the distance zone (foreground,middleground,background)

13<Slope Class based on soils inventory. Code 1 = 0-35%; Code 2 = 36-55%; Code 3 = 56-75%; Code 4 = >75%
Note: Reliability is limited as the slope is an average for a large soil mapping unit. The setting (avg size 16 acres) may or may not reflect the average.

14<Minimum Elevation - The lowest elevation recorded for the setting rounded to the nearest 100 feet. 1 = 100'; 8 = 800'; 15 = 1500'

15<Maximum Elevation - The highest elevation recorded for the setting rounded to the nearest 100 feet. (see above)

16<Wind Throw - The risk of windthrow based on topographic and species factors (E = existing widthrow, VH = very high risk, H = high risk, M = medium, L = low risk). Based on a combination of topographic features and site features (Harris, PNW-GTR-244), as well as field inspection.

17<Soil Mapping Unit - A setting may contain one or more mapped soil types. The predominent soil type is listed. For interpretation of soil mapping unit codes see R-10 Soil & Water Handbook.

18<Ecological Codes - See Ketchikan Area Plant Associations Guide (Demeo) for interpretations.

19<Mass Movement Index - MMI 1 = Low Hazard; MMI 2 = Moderate Hazard; MMI 3 = High Hazard; MMI 4 = Very High Hazard; Note listed for item 13 applies to MMI codes as well.

20<Percent McGilvery Soils. Used to indicate potential regeneration problems. Code 1 = 0-9%; 2 = 10-19%; 3 = 20-29%; 4 = 30-39% and 5 = 40-100% McGilvery Soils.

21<Site Index - Measure of productivity and is based on a 50 year period. ie a site with an index of 85 will produce trees 85 feet tall in 50 years.

22<Wetland Habitat Codes - Indicates the type of wetland or non wetland habitat. Used as an indicator of logging system requirements.

23<Riparian Habitats - Based on soil mapping units not AHMU prescriptions. Used to indicate potential regeneration problems.

24<Logging Method - Type of logging system recommended to meet all resource concerns including suspension requirements. Codes include HL = Highlead RS = Running Skyline; LS = Live Skyline (shotgun or flyer); SL = Slackline (live skyline w/haulback); SS = Standing Skyline; MS = Multi-span Skyline; HE = Helicopter: CD = Cold Deck and Swing operation: SH = Shovel Yarding. A-Frame logging is primarily used for salvage logging due to the 500' beach fringe and 1000' estuary buffer being applied in this EIS.

25<Harvest Method - CC = Type I clearcut; C2 = Type II clearcut; SW = Two step shelterwood that harvests Alaska yellowceder larger than 12-16" DBH (depending upon the site) and leaves the Alaska yellowcedar smaller than the specified diameter for seed production and shelter.

26<Proposed Future Management - Codes include the following:

FH = Final Harvest (Overstory Removal after advance regeneration established)
RS = Regeneration Survey 3rd & 5th yeras after harvest
Plant (SS,RC,YC) = Plant Sitka Spruce, Western Redcedar, or Alaska yellowcedar
SS = Survival Surveys (staked tree surveys and regeneration surveys) in plantations
TMPCT = Timber precommercial thinning 12'X12' at age 15-20 years recommended
WLPCT = Wildlife precommercial thinning 12'X12' to 16'X16' spacing recommended between ages of 12 and 20. On an average site the onset of crown closure and reduced radial increment occurs at age 18. To avoid losing desirable understory forage thinning should occur before or shortly after the onset of canopy closure. Variation due to site quality needs to be accounted for.
CT = Commercial Thinning
CC = Clearcut
SW = Shelterwood

VCU	HAU T#	SET IN G#	LU D	RL EU VD	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIR NO DW	SMU	ECO CODE	MMI	MCG	INSN ID TE EX	WET HAB	RIPH AA RB	MLE OT GH	HMAE RT VH	PROPOSED FUTURE MANAGEMENT
744	1	1	4	OG	7.3	3.7	0.0	0.0	11.0	325.3	EAST	MO	4	4	8	H	33D	CCS	3	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	1	2	4	OG	17.4	0.7	0.0	0.0	18.1	421.0	EAST	MO	3	4	8	H	25	CMM	1	1	30	SEC	N	RS	CC	RS,PLANT(YC),SS,CC
744	1	3	4	OG	8.8	0.2	0.0	0.0	9.1	222.6	EAST	MO	4	5	9	H	25	CMM	1	1	30	SEC	N	RS	CC	RS,PLANT(YC),SS,CC
	1				33.5	4.6	0.0	0.0	38.1	968.8																
744	5	7	4	TM	1.4	13.4	0.0	0.0	14.8	500.6	WEST	MM	3	5	8	H	320D	CCD	3	1	60	FW	N	LS	CC	RS,PLANT(YC),SS,CC
744	5	9	4	TM	20.7	0.4	0.0	0.0	21.1	460.1	SOUTH	MM	4	4	8	H	24E	CMC	1	1	60	SE	N	LS	CC	RS,CC
	5				22.1	13.8	0.0	0.0	35.9	960.7																
744	6	3	4	TM	12.3	0.2	0.0	0.0	12.5	339.6	WEST	MM	4	9	13	H	550E	CCD	3	1	68	FW	N	RS	CC	RS,PLANT(YC),SS,CC
744	6	4	4	TM	10.7	0.0	0.0	0.0	10.7	218.9	SOUTH	MM	4	9	13	H	25	CMM	1	1	30	SEC	N	RS	CC	RS,PLANT(YC),SS,CC
	6				22.9	0.2	0.0	0.0	23.2	558.5																
744	7	1	4	TM	7.8	28.6	0.0	0.0	36.4	1,178.5	WEST	MM	5	12	18	H	550E	CCD	3	1	68	FW	N	HE	SW	RS,FH,RS,R&W,2-SW
	7				7.8	28.6	0.0	0.0	36.4	1,178.5																
744	8	1	4	TM	0.0	7.1	0.0	0.0	7.1	244.5	WEST	MO	6	5	9	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	8	2	4	TM	0.0	11.8	0.0	0.0	11.8	407.0	WEST	MO	4	8	11	VH	1C	WDC	1	1	100	FNW	N	HE	C2	RS,CC
744	8	3	4	TM	0.0	4.4	0.0	0.0	4.4	153.1	WEST	MO	5	4	7	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	8	4	4	TM	0.0	8.2	0.0	0.0	8.2	283.9	WEST	MO	5	6	9	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	8	5	4	TM	0.0	17.1	0.0	0.0	17.1	591.3	WEST	MO	4	7	10	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	8	6	4	TM	0.0	3.9	0.0	0.0	3.9	133.1	WEST	MO	2	6	7	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	8	7	4	TM	0.0	12.5	0.0	0.0	12.5	432.7	WEST	MO	3	4	6	VH	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	8	8	4	TM	0.0	6.3	0.0	0.0	6.3	216.6	WEST	MM	3	3	5	H	31C	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,WLPCT,CT,CT,SW
744	8	9	4	TM	0.0	9.7	0.0	0.0	9.7	335.3	WEST	MM	3	2	4	H	31C	CCD	2	1	80	FW	N	SH	CC	RS,PLANT(YC),SS,WLPCT,CT,CT,SW
744	8	10	4	TM	0.0	10.9	0.0	0.0	10.9	375.5	WEST	MO	3	5	7	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
	8				0.0	91.9	0.0	0.0	91.9	3,172.9																
744	9	1	4	TM	0.0	4.7	0.0	0.0	4.7	163.7	NORTH	MM	5	7	10	E	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	9	2	4	TM	0.4	3.6	0.0	0.0	4.0	135.7	NORTH	MM	5	7	10	E	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	9	3	4	TM	1.0	5.4	0.0	0.0	6.5	215.7	NORTH	MM	5	7	10	E	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	9	4	4	TM	10.0	0.8	0.0	0.0	10.8	303.9	NORTH	MM	6	7	10	E	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	9	5	4	TM	10.2	0.0	0.0	0.0	10.2	281.2	NORTH	MM	7	6	10	E	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	9				21.6	14.6	0.0	0.0	36.3	1,100.2																

VCU	HAU T#	SET ING#	L U D	RL EU VD	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIR DW	SMU	ECO CODE	MMI	MCG	ISN ID TE EX	WET HAB	RIPH AA RB	MLE OT GH	HMAE RT VH	PROPOSED FUTURE MANAGEMENT
744	11	1	4	TM	0.0	4.1	2.9	0.0	7.1	275.5	EAST	MM	3	4	7	VH	19E	WHC	3	1	65	FW	N	RS	CC	RS,PLANT(YC),SS,CC
744	11	2	4	TM	0.0	3.2	1.6	0.0	4.8	184.2	EAST	MM	4	6	7	H	33E	CCS	3	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	11	3	4	TM	0.0	4.6	0.0	0.0	4.6	157.3	EAST	MM	4	4	7	H	33E	CCS	3	4	70	FIW	N	LS	CC	RS,PLANT(YC),SS,CC
744	11	4	4	TM	0.0	2.0	0.0	0.0	2.0	69.3	SOUTH	MM	6	6	7	H	33E	CCS	3	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	11	5	4	TM	4.4	5.3	0.0	0.0	9.8	305.8	EAST	MM	3	4	7	H	33E	CCS	3	4	70	FIW	N	LS	CC	RS,PLANT(YC),SS,CC
	11				4.4	19.2	4.6	0.0	28.2	992.2																
744	12	1	4	TM	0.0	32.2	2.7	0.0	34.9	1,235.4	EAST	MM	5	6	13	H	33E	CCS	3	4	70	FIW	N	HE	SW	RS,FH,RS,R&W,2-SW
	12				0.0	32.2	2.7	0.0	34.9	1,235.4																
737	13	1	4	ML	0.1	1.8	8.6	0.0	10.5	451.1	WEST	PR	3	4	7	H	74E	WHM	2	1	100	FNW	N	RS	CC	RS,CC
737	13	2	4	ML	0.0	0.0	13.3	0.0	13.3	597.9	WEST	PR	4	3	7	H	74E	WHM	2	1	100	FNW	N	RS	CC	RS,CC
737	13	3	4	ML	0.0	0.0	7.1	0.0	7.1	321.7	WEST	PR	6	6	10	H	54E	WHM	3	1	100	FNW	N	RS	CC	RS,CC
737	13	4	4	ML	0.0	0.0	6.4	0.0	6.4	286.9	WEST	MM	4	7	10	H	54E	WHM	3	1	100	FNW	N	RS	CC	RS,CC
	13				0.1	1.8	35.4	0.0	37.2	1,657.6																
737	14	1	4	ML	0.0	10.0	0.0	0.0	10.0	346.4	SOUTH	PR	4	6	9	H	54D	WHM	2	1	100	FNW	N	HE	SW	RS,FH,RS,R&W,2-SW
	14				0.0	10.0	0.0	0.0	10.0	346.4																
744	16	1	4	TM	14.8	0.0	0.0	0.0	14.8	408.4	SOUTH	MM	6	10	14	E	75E	WHS	2	4	80	FNW	N	RS	CC	RS,CC
744	16	2	4	TM	9.8	0.0	0.0	0.0	9.8	268.8	SOUTH	MM	5	9	11	E	75E	WHS	2	4	80	FNW	N	RS	CC	RS,CC
744	16	3	4	TM	19.7	0.0	0.0	0.0	19.7	458.1	SOUTH	MM	3	7	10	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	16	4	4	TM	11.5	0.0	0.0	0.0	11.5	225.0	SOUTH	MM	3	7	10	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	16	5	4	TM	7.2	0.0	0.0	0.0	7.2	131.4	SOUTH	MM	3	7	10	E	23	CMM	1	1	20	SES	N	RS	CC	RS,CC
744	16	6	4	TM	8.0	0.4	0.0	0.0	8.4	171.3	SOUTH	MM	2	8	10	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	16	7	4	TM	0.0	7.2	0.0	0.0	7.2	249.1	SOUTH	MM	2	8	10	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	16	8	4	TM	2.6	11.6	0.0	0.0	14.2	470.7	SOUTH	MM	3	8	11	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	16	9	4	TM	0.0	5.8	0.0	0.0	5.8	198.8	SOUTH	MM	2	8	10	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	16	10	4	TM	0.0	7.1	0.0	0.0	7.2	247.5	SOUTH	MM	2	8	10	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
	16				73.6	32.1	0.0	0.0	105.7	2,829.0																
737	17	1	4	ML	14.4	3.5	0.0	0.0	17.8	510.3	SOUTH	MO	5	13	19	H	74D	WHM	3	1	100	FNW	N	HE	SW	RS,FH,RS,R&W,2-SW
737	17	2	4	ML	0.3	18.8	0.0	0.0	19.1	651.7	SOUTH	MO	6	7	14	M	550D	CCD	3	1	70	FW	N	HE	SW	RS,FH,RS,R&W,2-SW
	17				14.7	22.3	0.0	0.0	36.9	1,162.0																

VCU	HAUL VISIT NO	SETT ING#	LUD	RL EU VD	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOP E	MIN ELEV	MAX ELEV	TIR WH NO DW	SMU	ECO CODE	MM I	MM C G	INSN ID TE EX	WET HAB	RIPH RB	MLEA GH	HMAE OT RT	PROPOSED FUTURE MANAGEMENT
744	18	1	4	TM	6.3	2.1	0.0	0.0	8.4	235.6	EAST	MO	6	2	9	E	550E	CCD	3	1	68	FW	N	RS	CC	RS,PLANT(YC),SS,CC
744	18	2	4	TM	18.3	4.6	0.0	0.0	22.9	629.3	EAST	MM	5	3	10	E	550E	CCD	3	1	68	FW	N	RS	CC	RS,PLANT(YC),SS,CC
744	18	3	4	TM	0.9	10.7	0.0	0.0	11.6	394.8	EAST	MM	5	3	7	E	550E	CCD	3	1	68	FW	N	RS	CC	RS,PLANT(YC),SS,CC
	18				25.5	17.3	0.0	0.0	42.9	1,259.7																
744	19	1	4	TM	3.0	0.0	0.0	0.0	3.0	26.8	SOUTH	MM	5	7	12	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	2	4	TM	4.4	0.0	0.0	0.0	4.4	38.9	SOUTH	MM	4	7	12	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	3	4	TM	7.7	0.4	0.0	0.0	8.1	81.9	SOUTH	MM	4	7	10	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	4	4	TM	0.8	1.9	0.0	0.0	2.7	72.2	SOUTH	MM	3	8	11	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	5	4	TM	0.4	1.5	0.0	0.0	1.9	54.6	SOUTH	MM	4	8	11	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	6	4	TM	0.0	8.0	0.0	0.0	8.0	274.7	SOUTH	MM	4	8	11	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	7	4	TM	2.8	10.6	0.0	0.0	13.4	443.5	SOUTH	MM	4	8	11	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	8	4	TM	0.8	6.9	0.0	0.0	7.6	244.8	SOUTH	MM	4	8	11	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	19				19.9	29.3	0.0	0.0	49.2	1,237.5																
744	20	1	4	TM	22.8	0.0	0.0	0.0	22.8	200.3	WEST	MM	6	6	13	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	20	2	4	TM	11.8	0.0	0.0	0.0	11.8	103.9	WEST	MM	5	6	12	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	20	3	4	TM	9.1	0.0	0.0	0.0	9.1	79.7	SOUTH	MM	5	7	12	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	20				43.6	0.0	0.0	0.0	43.6	383.9																
744	21	1	4	TM	7.7	0.0	0.0	0.0	7.7	206.4	NORTH	MM	7	8	14	E	74E	WHM	2	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,CC
	21				7.7	0.0	0.0	0.0	7.7	206.4																
744	22	1	4	TM	0.6	11.2	0.0	0.0	11.7	390.7	SOUTH	MM	3	7	11	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	22	2	4	TM	0.0	9.4	0.0	0.0	9.4	324.6	SOUTH	MM	4	7	11	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	22	3	4	TM	0.0	5.2	0.0	0.0	5.2	178.1	SOUTH	MM	4	7	11	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	22	4	4	TM	0.4	2.4	0.0	0.0	2.9	88.4	SOUTH	MM	2	7	8	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	22	5	4	TM	0.1	4.1	0.0	0.0	4.3	143.9	SOUTH	MM	2	7	8	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	22				1.1	32.3	0.0	0.0	33.4	1,125.6																
744	24	1	4	ML	0.0	0.0	14.2	0.0	14.2	642.2	WEST	MO	5	12	17	E	1E	WDC	3	1	100	FNW	N	SL	CC	RS,PLANT(YC),SS,CC
744	24	2	4	ML	0.0	0.0	15.8	0.0	15.8	712.9	SOUTH	MO	7	11	17	E	1E	WDC	3	1	100	FNW	N	SL	CC	RS,PLANT(YC),SS,CC
	24				0.0	0.0	30.0	0.0	30.0	1,355.1																

VCU	HAU RNVI EIST T#	SE TI NG#	LU D	RL EU VD	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOP E	MIN ELEV	MAX ELEV	TWIR NO DW	SMU	ECO CODE	MMI	MMG	ISNID TE EX	WET HAB	RIPH AA RB	RMLE OT GH	HMAE RT VH	PROPOSED FUTURE MANAGEMENT
744	28	1	4	ML	0.0	0.0	15.1	0.0	15.1	680.9	NORTH	PR	5	4	10	E	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	28				0.0	0.0	15.1	0.0	15.1	680.9																
744	29	1	4	ML	0.0	3.8	2.1	0.0	5.9	225.7	WEST	PR	5	7	10	E	1D	WDC	2	1	100	FNW	N	RS	CC	RS,CC
	29				0.0	3.8	2.1	0.0	5.9	225.7																
744	30	1	4	ML	0.0	14.9	5.4	0.0	20.2	755.9	WEST	MO	5	8	15	E	1D	WDC	2	1	100	FNW	N	RS	CC	RS,CC
	30				0.0	14.9	5.4	0.0	20.2	755.9																
744	35	1	4	ML	0.0	9.7	0.0	0.0	9.7	335.7	WEST	PR	4	6	11	VH	1D	WDC	2	1	100	FNW	N	RS	CC	RS,CC
744	35	2	4	ML	0.0	5.4	0.0	0.0	5.4	186.3	NORTH	PR	4	6	11	VH	1D	WDC	2	1	100	FNW	N	RS	CC	RS,CC
744	35	3	4	ML	1.7	5.1	0.0	0.0	6.8	191.5	WEST	MO	6	9	13	VH	1D	WDC	2	1	100	FNW	N	HE	SW	RS,FH,RS,R&W,2-SW
	35				1.7	20.2	0.0	0.0	21.9	713.5																
744	37	1	4	ML	6.1	20.7	0.0	0.0	26.8	767.7	WEST	MO	6	9	20	H	550D	CCD	3	1	70	FW	N	HE	SW	RS,FH,RS,R&W,2-SW
	37				6.1	20.7	0.0	0.0	26.8	767.7																
744	41	1	4	ML	0.0	0.0	3.3	0.0	3.3	149.3	SOUTH	MO	5	7	10	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	41	2	4	ML	0.0	0.0	7.4	0.0	7.4	334.2	SOUTH	PR	5	5	9	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	41	3	4	ML	0.0	0.0	1.6	0.0	1.6	72.4	SOUTH	PR	4	5	7	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	41				0.0	0.0	12.3	0.0	12.3	555.9																
744	47	1	4	ML	0.0	0.0	1.9	0.0	1.9	83.5	WEST	MO	3	8	10	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	47	2	4	ML	0.0	0.0	14.4	0.0	14.4	649.7	WEST	MO	4	8	13	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	47	3	4	ML	0.0	0.0	8.9	0.0	8.9	401.6	WEST	MO	4	7	12	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	47				0.0	0.0	25.2	0.0	25.2	1,134.8																
744	48	1	4	TM	0.0	0.0	11.7	0.0	11.7	528.5	WEST	MO	3	5	9	H	4D	CMB	2	1	70	FW	N	RS	CC	RS,CC
	48				0.0	0.0	11.7	0.0	11.7	528.5																

VCU	STAND	SITE TREE	LU	DEV	RL EU VD	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	SLOPE	ELEV	ELEV	TWIG DW	TWIG SMU	ECO CODE	MM I	MM G	INSITE EX	INSITE TE	INSITE HAB	RIPARIAN AA	RIPARIAN RB	MELOT GH	HMRT VH	PROPOSED FUTURE MANAGEMENT
744	49	1	4	TM	0.0	0.0	14.5	0.0	14.5	655.6	NORTH	MO	4	3	10	H	4D	CMB	2	1	70	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	49	2	4	TM	0.0	0.0	12.9	0.0	12.9	583.1	NORTH	MM	5	5	10	VH	1F	WDC	3	1	100	FNW	N	RS	CC	RS,CC
744	49	3	4	ML	0.0	1.9	8.8	0.0	10.8	465.8	NORTH	MM	5	5	10	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,CC
744	49	4	4	ML	0.0	0.0	7.5	0.0	7.5	337.5	NORTH	MM	5	9	13	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,CC
	49				0.0	1.9	43.8	0.0	45.7	2,041.9																		
744	51	1	4	TM	0.0	2.6	0.0	0.0	2.6	89.9	WEST	MO	5	9	12	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	51	2	4	TM	0.9	8.4	0.0	0.0	9.3	297.5	WEST	MO	4	11	16	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	51	3	4	TM	0.0	11.1	0.0	0.0	11.1	384.3	WEST	MM	4	9	14	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	51				0.9	22.1	0.0	0.0	23.0	771.7																		
744	52	1	4	TM	0.0	4.8	5.7	0.0	10.6	425.5	WEST	MO	6	10	17	H	4D	CMB	2	1	70	FW	N	RS	CC	RS,PLANT(YC),SS,CC
744	52	2	4	TM	0.9	19.1	0.1	0.0	20.2	674.3	WEST	MO	5	11	17	VH	1C	WDC	1	1	100	FW	N	RS	CC	RS,CC
744	52	3	4	TM	0.0	7.0	0.0	0.0	7.0	242.8	WEST	MO	4	8	10	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	52	4	4	TM	0.0	10.2	0.0	0.0	10.2	351.8	WEST	MO	4	8	10	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
	52				0.9	41.2	5.9	0.0	48.0	1,694.3																		
744	53	1	4	TM	7.8	0.0	0.0	0.0	7.8	158.3	WEST	MO	5	19	22	VH	245E	MHA	1	1	9	AM	N	RS	CC	RS,PLANT(YC),SS,CC
744	53	2	4	TM	7.4	0.0	0.0	0.0	7.4	194.3	WEST	MO	5	18	23	VH	245E	MHA	1	1	9	AM	N	RS	CC	RS,PLANT(YC),SS,CC
744	53	3	4	TM	17.8	0.5	0.0	0.0	18.3	411.4	WEST	MO	5	17	23	VH	245E	MHA	1	1	9	AM	N	RS	CC	RS,PLANT(YC),SS,CC
	53				32.9	0.5	0.0	0.0	33.4	764.0																		
744	55	2	4	TM	0.0	3.2	0.0	0.0	3.2	109.6	WEST	MM	4	3	6	H	31C	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,WLPCT,CT,CT,SW
744	55	3	4	TM	0.0	6.5	0.0	0.0	6.5	223.2	WEST	MM	4	3	6	H	31C	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,WLPCT,CT,CT,SW
	55				0.0	9.6	0.0	0.0	9.6	332.8																		
744	57	1	4	TM	1.0	4.9	0.0	0.0	5.9	197.6	WEST	MM	3	5	7	VH	528D	WHS	2	4	75	FNW	N	RS	CC	RS,CC
744	57	2	4	TM	0.0	7.7	0.0	0.0	7.7	265.4	WEST	MM	3	5	7	VH	528D	WHS	2	4	75	FNW	N	RS	CC	RS,CC
744	57	3	4	TM	0.1	4.5	0.0	0.0	4.6	159.6	EAST	MM	3	6	7	VH	528D	WHS	2	4	75	FNW	N	SH	CC	RS,CC
744	57	4	4	TM	0.0	12.1	0.0	0.0	12.1	417.8	WEST	MM	3	3	7	VH	1C	WDC	1	1	100	FNW	N	LS	CC	RS,CC
	57				1.2	29.2	0.0	0.0	30.4	1,040.3																		

VCU	HAUL RN VI EI ST T#	SEG#	LID	RL VD	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIR NO	SMU	ECO CODE	MMI	MCG	INSID TEXT	WET HAB	IRIPH RB	MLEAA GH	HMAERT VH	PROPOSED FUTURE MANAGEMENT
744	59	7	4	TM	2.8	0.0	0.0	0.0	2.8	74.9	NORTH	MM	4	5	7	VH	528D	WHS	2	4	75	FNW	N	RS	CC	RS,CC
744	59	1	4	TM	7.4	0.0	0.0	0.0	7.4	203.5	WEST	MM	3	4	6	H	31C	CCD	2	1	80	FW	N	RS	CC	RS,CC
744	59	2	4	TM	2.5	0.0	0.0	0.0	2.5	69.8	WEST	MM	2	4	5	H	20C	CMB	1	1	45	FW	N	SH	CC	RS,CC
744	59	3	4	TM	10.2	0.0	0.0	0.0	10.2	239.8	WEST	MM	2	4	6	VH	528D	WHS	2	4	75	FNW	N	RS	CC	RS,CC
744	59	4	4	TM	4.5	0.0	0.0	0.0	4.5	102.8	NORTH	MM	2	5	6	VH	528D	WHS	2	4	75	FNW	N	SH	CC	RS,CC
744	59	5	4	TM	3.4	0.0	0.0	0.0	3.4	73.1	WEST	MM	2	5	7	VH	528D	WHS	2	4	75	FNW	N	RS	CC	RS,CC
744	59	6	4	TM	6.9	0.9	0.0	0.0	7.8	222.0	NORTH	MM	2	5	7	VH	528D	WHS	2	4	75	FNW	N	RS	CC	RS,CC
	59				37.8	0.9	0.0	0.0	38.7	985.8																
744	61	1	4	TM	3.2	0.0	0.0	0.0	3.2	50.8	NORTH	MM	6	7	10	E	74D	WHM	3	1	100	FNW	N	HE	C2	RS,R&W,CC
744	61	2	4	TM	3.1	0.0	0.0	0.0	3.1	37.3	NORTH	MM	5	7	11	E	74D	WHM	3	1	100	FNW	N	HE	C2	RS,R&W,CC
744	61	3	4	TM	9.5	0.0	0.0	0.0	9.5	260.5	NORTH	MM	5	8	15	E	75F	WHS	3	4	80	FNW	N	HE	C2	RS,R&W,CC
	61				15.8	0.0	0.0	0.0	15.8	348.6																
744	62	1	4	TM	44.2	0.0	0.0	0.0	44.2	881.5	NORTH	MM	5	13	20	E	550E	CCD	3	1	68	FW	N	HE	SW	RS,FH,RS,R&W,2-SW
	62				44.2	0.0	0.0	0.0	44.2	881.5																
744	66	1	4	TM	5.0	0.0	0.0	0.0	5.0	67.0	SOUTH	MM	5	19	21	E	528E	WHS	3	4	75	FNW	N	RS	CC	RS,CC
744	66	2	4	TM	11.3	0.0	0.0	0.0	11.3	309.8	SOUTH	MM	7	15	20	E	75E	WHS	2	4	80	FNW	N	RS	CC	RS,CC
744	66	3	4	TM	9.2	0.0	0.0	0.0	9.2	185.3	SOUTH	MM	6	16	20	E	528E	WHS	3	4	75	FNW	N	RS	CC	RS,CC
744	66	4	4	TM	5.7	0.0	0.0	0.0	5.7	157.3	SOUTH	MM	8	14	18	E	75E	WHS	2	4	80	FNW	N	RS	CC	RS,CC
744	66	5	4	TM	7.3	0.0	0.0	0.0	7.3	201.5	SOUTH	MM	7	11	16	E	75E	WHS	2	4	80	FNW	N	RS	CC	RS,CC
744	66	6	4	TM	9.4	0.0	0.0	0.0	9.4	257.8	SOUTH	MM	6	10	16	E	75E	WHS	2	4	80	FNW	N	RS	CC	RS,CC
744	66	7	4	TM	4.2	0.0	0.0	0.0	4.2	90.9	SOUTH	MM	6	14	18	E	25	CMM	1	1	30	SEC	N	RS	CC	RS,PLANT(YC),SS,CC
744	66	8	4	TM	2.8	0.0	0.0	0.0	2.8	77.9	EAST	MM	8	11	15	E	528E	WHS	3	4	75	FNW	N	RS	CC	RS,CC
	66				55.0	0.0	0.0	0.0	55.0	1,347.5																
744	67	1	4	TM	5.7	0.0	0.0	0.0	5.7	156.4	WEST	MM	7	8	12	VH	74F	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	67	2	4	TM	24.1	0.0	0.0	0.0	24.1	541.7	WEST	MM	6	6	13	VH	74F	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	67	3	4	TM	10.9	0.0	0.0	0.0	10.9	208.4	WEST	MM	5	6	12	VH	74F	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	67				40.6	0.0	0.0	0.0	40.6	906.5																
744	68	1	4	TM	4.2	0.0	0.0	0.0	4.2	54.2	WEST	MM	2	4	6	H	20C	CMB	1	1	45	FW	N	LS	CC	RS,CC
	68				4.2	0.0	0.0	0.0	4.2	54.2																

VCU	HAUL VISIT NO	SEG#	LU	D	RL EU VD	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIR NO DW	SMU	ECO CODE	MM I	MC G	INSID TE EX	WET HAB	RIPH AA RB	MLE OT GH	HMAE RT VH	PROPOSED FUTURE MANAGEMENT
744	72	1	4	TM	1.6	4.1	0.0	0.0	5.6	183.9	NORTH	MM	6	7	11	H	550E	CCD	3	1	68	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	72	2	4	TM	8.1	0.1	0.0	0.0	8.3	228.1	WEST	MM	5	7	11	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,CC
744	72	3	4	TM	5.0	0.2	0.0	0.0	5.2	144.2	WEST	MM	5	7	12	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,CC
744	72	4	4	TM	4.9	5.7	0.0	0.0	10.6	333.0	WEST	MM	6	7	14	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,CC
	72				19.6	10.1	0.0	0.0	29.7	889.1																
744	73	1	4	TM	0.5	9.7	0.1	0.0	10.3	343.6	WEST	MM	5	7	11	H	550E	CCD	3	1	68	FW	N	RS	CC	RS,CC
744	73	2	4	TM	0.5	7.1	0.0	0.0	7.6	248.4	WEST	MM	5	7	11	H	550E	CCD	3	1	68	FW	N	RS	CC	RS,CC
744	73	3	4	TM	3.1	2.6	0.0	0.0	5.7	116.5	WEST	MM	3	7	9	H	550E	CCD	3	1	68	FW	N	RS	CC	RS,CC
744	73	4	4	TM	2.7	9.5	0.0	0.0	12.2	350.9	NORTH	MM	5	8	11	H	550E	CCD	3	1	68	FW	N	RS	CC	RS,PLANT(YC),SS,CC
	73				6.8	28.8	0.1	0.0	35.7	1,059.4																
744	74	1	4	TM	5.1	0.0	0.0	0.0	5.1	65.6	NORTH	MM	5	14	18	H	25	CMM	1	1	30	SEC	N	HE	SW	RS,FH,RS,R&W,2-SW
	74				5.1	0.0	0.0	0.0	5.1	65.6																
744	76	1	4	TM	11.7	0.0	0.0	0.0	11.7	215.8	EAST	MM	3	7	8	L	25	CMM	1	1	30	SEC	N	RS	CC	RS,PLANT(YC),SS,CC
744	76	2	4	TM	11.8	0.0	0.0	0.0	11.8	257.5	SOUTH	MM	3	6	8	L	25	CMM	1	1	30	SEC	N	RS	CC	RS,PLANT(YC),SS,CC
744	76	3	4	TM	6.2	0.0	0.0	0.0	6.2	135.2	SOUTH	MM	2	6	7	L	25	CMM	1	1	30	SEC	N	RS	CC	RS,PLANT(YC),SS,CC
	76				29.8	0.0	0.0	0.0	29.8	608.5																
744	77	1	4	TM	2.5	0.0	0.0	0.0	2.5	68.2	WEST	MM	5	8	11	H	33E	CCS	3	4	70	FIW	N	RS	CC	RS,CC
744	77	2	4	TM	4.7	0.0	0.0	0.0	4.7	130.3	SOUTH	MM	5	8	11	H	33E	CCS	3	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
	77				7.2	0.0	0.0	0.0	7.2	198.5																
744	81	1	4	TM	0.8	6.9	0.0	0.0	7.7	257.3	NORTH	MM	5	8	12	M	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	81	2	4	TM	0.9	9.7	0.0	0.0	10.6	354.5	NORTH	MM	4	7	12	M	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	81	3	4	TM	1.2	6.0	0.0	0.0	7.2	240.5	NORTH	MM	5	8	11	M	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
	81				2.8	22.6	0.0	0.0	25.5	852.2																
744	82	1	4	TM	0.0	0.0	1.9	0.0	1.9	87.1	NORTH	MM	3	6	8	M	23	CMM	1	1	20	SES	N	RS	CC	RS,PLANT(YC),SS,CC
744	82	2	4	TM	0.0	0.0	11.2	0.0	11.2	503.8	NORTH	MM	4	6	9	M	32D	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,TMPCT,CT,CT,SW
744	82	3	4	TM	0.0	5.4	2.0	0.0	7.4	276.7	NORTH	MM	3	7	9	M	32D	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,TMPCT,CT,CT,SW
744	82	4	4	TM	0.3	3.2	0.0	0.0	3.4	111.1	NORTH	MM	3	7	9	M	32D	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,TMPCT,CT,CT,SW
	82				0.3	8.5	15.1	0.0	23.9	978.7																

VCU	HAU T#	SET SIT N G#	U	D	LRL EU VD	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIR DW	SMU	ECO CODE	MMI	MCG	ISN ID TE EX	WET HAB	RIPH AA RB	MLE OT GH	HMAE RT VH	PROPOSED FUTURE MANAGEMENT
744	83	1	4	TM	3.4	1.9	0.0	0.0	5.4	113.0	EAST	MM	2	7	8	H	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	83	2	4	TM	5.1	0.1	0.0	0.0	5.2	102.7	EAST	MM	1	7	7	H	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	83	3	4	TM	10.8	0.0	0.0	0.0	10.8	261.4	EAST	MM	2	6	7	H	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
	83				19.3	2.0	0.0	0.0	21.3	477.2																
744	84	1	4	TM	20.6	0.0	0.0	0.0	20.6	558.2	NORTH	MM	4	12	16	H	33E	CCS	3	4	70	FIW	N	HE	SW	RS,FH,RS,R&W,2-SW
	84				20.6	0.0	0.0	0.0	20.6	558.2																
744	85	1	4	TM	7.0	42.6	0.0	0.0	49.6	1,662.7	EAST	MM	7	7	18	VH	19E	WHC	3	1	65	FW	N	HE	SW	RS,FH,RS,R&W,2-SW
	85				7.0	42.6	0.0	0.0	49.6	1,662.7																
744	86	1	4	TM	3.7	0.0	0.0	0.0	3.7	98.9	SOUTH	MM	3	4	6	H	320D	CCD	3	1	60	FW	N	RS	CC	RS,PLANT(YC),SS,CC
744	86	2	4	TM	5.9	0.0	0.0	0.0	5.9	154.2	SOUTH	MM	2	4	5	H	320D	CCD	3	1	60	FW	N	RS	CC	RS,PLANT(YC),SS,CC
744	86	3	4	TM	2.7	1.3	0.0	0.0	3.9	100.0	SOUTH	MM	1	3	4	H	320D	CCD	3	1	60	FW	N	SH	CC	RS,PLANT(YC),SS,CC
	86				12.3	1.3	0.0	0.0	13.5	353.2																
744	90	1	4	OG	10.2	0.0	0.0	0.0	10.2	208.9	EAST	MO	4	5	9	H	25	CMM	1	1	30	SEC	N	RS	CC	RS,CC
	90				10.2	0.0	0.0	0.0	10.2	208.9																
737	92	1	4	TM	7.9	0.4	0.0	0.0	8.3	230.5	NORTH	MO	4	8	12	H	550D	CCD	3	1	70	FW	N	RS	CC	RS,PLANT(YC),SS,CC
737	92	2	4	TM	11.6	0.0	0.0	0.0	11.7	321.3	WEST	MO	2	7	9	H	550D	CCD	3	1	70	FW	N	RS	CC	RS,PLANT(YC),SS,CC
737	92	3	4	TM	3.7	11.8	0.0	0.0	15.6	511.3	WEST	MO	4	8	11	H	550D	CCD	3	1	70	FW	N	RS	CC	RS,PLANT(YC),SS,CC
737	92	4	4	TM	6.3	5.0	0.0	0.0	11.2	344.3	WEST	MO	4	10	13	H	550D	CCD	3	1	70	FW	N	SH	CC	RS,PLANT(YC),SS,CC
737	92	5	4	TM	5.9	0.0	0.0	0.0	5.9	162.2	WEST	MO	3	11	13	H	550D	CCD	3	1	70	FW	N	RS	CC	RS,PLANT(YC),SS,CC
737	92	6	4	TM	3.6	0.0	0.0	0.0	3.6	99.4	WEST	MO	2	8	9	H	49D	CMM	1	1	20	FEF	N	RS	CC	RS,CC
737	92	7	4	TM	10.0	0.2	0.0	0.0	10.2	281.5	NORTH	MO	3	7	10	H	49D	CMM	1	1	20	FEF	N	RS	CC	RS,CC
	92				49.0	17.4	0.0	0.0	66.5	1,950.4																
737	93	1	4	TM	0.1	10.4	0.0	0.0	10.5	361.0	SOUTH	MO	5	10	14	E	528D	WHS	2	4	75	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
737	93	2	4	TM	8.0	1.9	0.0	0.0	9.9	282.8	SOUTH	MO	4	11	16	E	528E	WHS	3	4	75	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
737	93	3	4	TM	2.3	14.2	0.0	0.0	16.5	552.2	SOUTH	MO	4	8	13	E	528D	WHS	2	4	75	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
737	93	4	4	TM	1.6	2.9	0.0	0.0	4.4	142.6	SOUTH	MO	5	7	12	E	528D	WHS	2	4	75	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	93				11.9	29.4	0.0	0.0	41.4	1,338.6																

VCU	HAU	SET	LU	D	RL EU VD	V O L C4	V O L C5	V O L C6	V O L C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIR NO DW	SMU	ECO CODE	MM I	MC G	INSID TE EX	WET HAB	RIPH RB	MLE AA	MOT GH	HMAE RT VH	PROPOSED FUTURE MANAGEMENT
737	95	1	4		TM	3.3	0.0	0.0	0.0	3.3	89.7	EAST	MO	4	10	12	E	18D	CCD	3	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,CC
737	95	2	4		TM	16.3	0.0	0.0	0.0	16.3	439.0	EAST	MO	3	9	13	E	18D	CCD	3	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,CC
	95					19.6	0.0	0.0	0.0	19.6	528.7																
737	97	1	4		ML	0.0	5.7	0.0	0.0	5.7	196.9	NORTH	MO	7	20	24	H	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
737	97	2	4		ML	0.0	6.9	0.0	0.0	6.9	237.7	NORTH	MO	5	20	24	H	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
737	97	3	4		ML	0.0	6.0	0.0	0.0	6.0	207.4	WEST	MO	6	20	23	H	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	97					0.0	18.6	0.0	0.0	18.6	642.0																
737	98	1	4		ML	0.0	8.9	0.0	0.0	8.9	307.2	NORTH	MO	5	16	20	H	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
737	98	2	4		ML	0.0	17.6	0.0	0.0	17.6	608.1	NORTH	MO	6	15	20	H	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	98					0.0	26.5	0.0	0.0	26.5	915.3																
737	104	1	4		ML	1.5	24.5	0.0	0.0	26.0	886.5	SOUTH	PR	6	15	22	H	74D	WHM	3	1	100	FNW	N	HE	SW	RS,FH,RS,R&W,2-SW
	104					1.5	24.5	0.0	0.0	26.0	886.5																
737	106	1	4		ML	1.5	7.1	0.0	0.0	8.6	287.1	SOUTH	MO	3	17	19	H	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
737	106	2	4		ML	0.0	3.2	0.0	0.0	3.2	109.9	WEST	MO	6	15	17	VH	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
737	106	3	4		ML	0.0	3.0	0.0	0.0	3.0	104.6	WEST	MO	6	14	17	VH	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
737	106	4	4		ML	0.3	6.1	0.0	0.0	6.4	219.1	WEST	MO	5	12	17	VH	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
737	106	5	4		ML	1.5	11.1	0.0	0.0	12.6	424.5	SOUTH	MO	5	10	17	VH	75F	WHS	3	4	80	FNW	N	LS	CC	RS,PLANT(YC),SS,CC
737	106	6	4		ML	1.3	8.3	0.0	0.0	9.6	322.2	SOUTH	MO	5	10	17	VH	75F	WHS	3	4	80	FNW	N	LS	CC	RS,PLANT(YC),SS,CC
	106					4.6	38.9	0.0	0.0	43.4	1,467.4																
737	107	1	4		ML	2.6	20.1	0.0	0.0	22.7	759.6	SOUTH	MO	5	14	20	H	75F	WHS	3	4	80	FNW	N	HE	SW	RS,FH,RS,R&W,CC
	107					2.6	20.1	0.0	0.0	22.7	759.6																
737	110	1	4		TM	0.1	7.7	0.0	0.0	7.8	268.7	SOUTH	MM	3	6	8	M	24E	CMC	1	1	60	SE	N	RS	CC	RS,PLANT(YC),SS,2-SW
737	110	2	4		ML	0.0	4.1	0.0	0.0	4.1	140.9	SOUTH	MM	4	6	8	H	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,2-SW
737	110	3	4		TM	0.7	4.4	0.0	0.0	5.1	159.6	SOUTH	MM	0	6	8	M	24E	CMC	1	1	60	SE	N	RS	CC	RS,PLANT(YC),SS,2-SW
	110					0.7	16.2	0.0	0.0	17.0	569.3																

VCU	HAU RNVIEST T#	SET IN G#	L U D	RL EU VD	V O L C4	V O L C5	V O L C6	V O L C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	T WHIR MIN ELEV	MAX ELEV	NO DW	SMU	ECO CODE	MM I	MC G	I SNID TE EX	WET HAB	IR PH RB	M LE AA OT GH	HM AE RT VH	PROPOSED FUTURE MANAGEMENT
746	111	1	4	TM	3.2	0.0	0.0	0.0	3.2	88.1	EAST	MM	3	3	5	M	25	CMM	1	1	30	SEC	N	RS	CC	RS,PLANT(YC),SS,CC
746	111	2	4	TM	4.6	0.0	0.0	0.0	4.6	125.1	EAST	MM	3	3	5	M	25	CMM	1	1	30	SEC	N	RS	CC	RS,PLANT(YC),SS,CC
	111				7.8	0.0	0.0	0.0	7.8	213.2																
746	119	1	4	ML	5.0	0.0	0.0	0.0	5.0	137.2	EAST	MM	2	3	5	M	24D	CMC	1	1	60	SE	N	RS	CC	RS,PLANT(YC),SS,CC
	119				5.0	0.0	0.0	0.0	5.0	137.2																
746	120	1	4	ML	12.0	8.1	0.0	0.0	20.1	610.4	EAST	MM	3	4	8	H	1D	WDC	2	1	100	FNW	N	RS	CC	RS,TMPCT,CT,CT,2-SW
	120				12.0	8.1	0.0	0.0	20.1	610.4																
746	121	1	4	SV	0.7	4.3	0.0	0.0	5.0	154.6	WEST	PR	1	8	9	H	2D	WDC	2	1	100	FNW	N	RS	CC	RS,TMPCT,CT,CT,2-SW
	121				0.7	4.3	0.0	0.0	5.0	154.6																
746	125	1	4	TM	3.1	0.0	0.0	0.0	3.1	65.6	EAST	MM	1	3	3	M	25	CMM	1	1	30	SEC	N	RS	CC	RS,PLANT(YC),SS,CC
	125				3.1	0.0	0.0	0.0	3.1	65.6																
746	127	1	4	TM	8.7	0.0	0.0	0.0	8.7	202.7	NORTH	MM	1	2	4	M	25	CMM	1	1	30	SEC	N	SH	CC	RS,CC
	127				8.7	0.0	0.0	0.0	8.7	202.7																
744	130	1	4	TM	12.9	0.0	5.9	0.0	18.7	618.9	WEST	MM	5	9	14	VH	528F	WHS	3	4	75	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	130	2	4	TM	0.8	0.0	4.4	0.0	5.2	205.7	NORTH	MM	4	9	11	VH	528F	WHS	3	4	75	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	130				13.7	0.0	10.3	0.0	24.0	824.6																
744	131	1	4	TM	9.4	0.0	0.0	0.0	9.4	250.7	NORTH	MM	4	12	14	H	33E	CCS	3	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	131	2	4	TM	17.1	0.0	0.0	0.0	17.1	397.5	NORTH	MM	5	11	17	H	33E	CCS	3	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	131	3	4	TM	9.1	0.0	0.0	0.0	9.1	228.7	NORTH	MM	6	11	15	H	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
	131				35.7	0.0	0.0	0.0	35.7	876.9																
744	132	1	4	TM	22.7	0.0	0.0	0.0	22.7	593.3	SOUTH	MM	3	12	17	VH	74D	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	132				22.7	0.0	0.0	0.0	22.7	593.3																

VCU	HAU RN VI EI ST T#	SET I N G#	L U D	RL EU VD	V O L C4	V O L C5	V O L C6	V O L C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIR NO DW	SMU	ECO CODE	MM I	MC G	IDTE EX	WET HAB	RIPAA RB	MLEOT GH	HMAERT VH	PROPOSED FUTURE MANAGEMENT
744	133	1	4	ML	0.0	0.0	12.2	0.0	12.2	552.1	WEST	MO	4	15	19	E	1E	WDC	3	1	100	FNW	N	HE	SW	RS,FH,RS,R&W,2-SW
	133				0.0	0.0	12.2	0.0	12.2	552.1																
744	138	1	4	TM	0.0	6.9	0.0	0.0	6.9	238.6	WEST	MO	4	5	8	VH	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	138	2	4	TM	0.0	10.1	0.0	0.0	10.1	348.2	WEST	MO	4	5	9	VH	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	138	3	4	TM	0.3	11.6	0.0	0.0	11.9	407.6	WEST	MO	4	6	10	VH	74D	WHM	3	1	100	FNW	N	LS	CC	RS,CC
	138				0.3	28.6	0.0	0.0	28.8	994.4																
744	139	1	4	TM	2.5	15.0	0.0	0.0	17.4	582.4	WEST	MM	3	2	4	H	528D	WHS	2	4	75	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	139				2.5	15.0	0.0	0.0	17.4	582.4																
744	141	1	4	TM	0.0	0.0	2.3	0.0	2.3	103.0	SOUTH	MO	3	4	6	E	1E	WDC	3	1	100	FNW	N	RS	CC	RS,CC
	141				0.0	0.0	2.3	0.0	2.3	103.0																
					883.1	878.7	234.1	0.0	1,996.0	61,143.2																

VCU	HAUL VISIT#	SET UP GRP#	LAND UNIT	RL METHOD	V0L C4	V0L C5	V0L C6	V0L C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIR NO	SMU	ECO CODE	MMI	MCG	INSITE TREE EX	WET HAB	RIPARIAN RB	MEADOW AA	LEOTH GH	HMAE RT VH	PROPOSED FUTURE MANAGEMENT
744	3	1	4	ML	0.0	0.0	3.0	0.0	3.0	136.9	WEST	MO	3	10	14	H	528D	WHS	2	4	75	FNW	N	LS	CC	RS,PLANT(YC),SS,CC
744	3	2	4	ML	0.0	0.0	8.6	0.0	8.6	387.8	NORTH	MO	6	10	15	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,CC
744	3	3	4	ML	0.0	0.0	9.5	0.0	9.5	426.3	EAST	MO	5	12	16	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,CC
744	3	4	4	ML	0.0	0.0	16.4	0.0	16.4	739.9	NORTH	MO	4	10	18	VH	2E	WDC	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	3	6	4	ML	0.0	0.0	4.0	0.0	4.0	179.9	NORTH	MO	4	12	14	VH	2E	WDC	2	1	100	FNW	N	LS	CC	RS,CC
	3				0.0	0.0	41.5	0.0	41.5	1,870.9																
744	8	1	4	TM	0.0	7.1	0.0	0.0	7.1	244.5	WEST	MO	6	5	9	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	8	2	4	TM	0.0	11.8	0.0	0.0	11.8	407.0	WEST	MO	4	5	11	VH	1C	WDC	1	1	100	FNW	N	HE	C2	RS,CC
744	8	3	4	TM	0.0	4.4	0.0	0.0	4.4	153.1	WEST	MO	5	4	10	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	8	4	4	TM	0.0	8.2	0.0	0.0	8.2	283.9	WEST	MO	5	6	9	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	8	5	4	TM	0.0	17.1	0.0	0.0	17.1	591.3	WEST	MO	4	7	10	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	8	6	4	TM	0.0	3.9	0.0	0.0	3.9	133.1	WEST	MO	2	6	7	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	8	7	4	TM	0.0	12.5	0.0	0.0	12.5	432.7	WEST	MO	3	4	6	VH	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	8	8	4	TM	0.0	6.3	0.0	0.0	6.3	216.6	WEST	MO	3	3	5	H	31C	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,WLPCT,CT,CT,SW
744	8	9	4	TM	0.0	9.7	0.0	0.0	9.7	335.3	WEST	MO	3	2	4	H	31C	CCD	2	1	80	FW	N	SH	CC	RS,PLANT(YC),SS,WLPCT,CT,CT,SW
744	8	10	4	TM	0.0	10.9	0.0	0.0	10.9	375.5	WEST	MO	3	5	7	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
	8				0.0	91.9	0.0	0.0	91.9	3,172.9																
744	9	1	4	TM	0.0	4.7	0.0	0.0	4.7	163.7	NORTH	MM	5	7	10	E	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	9	2	4	TM	0.4	3.6	0.0	0.0	4.0	135.7	NORTH	MM	5	7	10	E	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	9	3	4	TM	1.0	5.4	0.0	0.0	6.5	215.7	NORTH	MM	5	7	10	E	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	9	4	4	TM	10.0	0.8	0.0	0.0	10.8	303.9	NORTH	MM	6	7	10	E	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	9	5	4	TM	10.2	0.0	0.0	0.0	10.2	281.2	NORTH	MM	7	6	10	E	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	9				21.6	14.6	0.0	0.0	36.3	1,100.2																
744	16	1	4	TM	14.8	0.0	0.0	0.0	14.8	408.4	SOUTH	MM	6	10	14	E	75E	WHS	2	4	80	FNW	N	RS	CC	RS,CC
744	16	2	4	TM	9.8	0.0	0.0	0.0	9.8	268.8	SOUTH	MM	5	9	11	E	75E	WHS	2	4	80	FNW	N	RS	CC	RS,CC
744	16	3	4	TM	19.7	0.0	0.0	0.0	19.7	458.1	SOUTH	MM	3	7	10	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	16	4	4	TM	11.5	0.0	0.0	0.0	11.5	225.0	SOUTH	MM	3	7	10	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	16	5	4	TM	7.2	0.0	0.0	0.0	7.2	131.4	SOUTH	MM	3	7	10	E	23	CMM	1	1	20	SES	N	RS	CC	RS,CC
744	16	7	4	TM	8.0	0.4	0.0	0.0	8.4	171.3	SOUTH	MM	2	7	11	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	16	7	4	TM	0.0	7.2	0.0	0.0	7.2	249.1	SOUTH	MM	2	7	11	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	16	8	4	TM	2.6	11.6	0.0	0.0	14.2	470.7	SOUTH	MM	3	8	11	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	16	9	4	TM	0.0	5.8	0.0	0.0	5.8	198.8	SOUTH	MM	2	8	10	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	16	10	4	TM	0.0	7.1	0.0	0.0	7.2	247.5	SOUTH	MM	2	8	10	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
	16				73.6	32.1	0.0	0.0	105.7	2,829.0																

VCU	HAU RN VI EI ST T#	SE TT IN G#	U	D	L RL EU VD	V O L C4	V O L C5	V O L C6	V O L C7	TOTAL ACRES	VOLUME MMBF	ASPECT	SLO P VQO	E	MIN ELEV	MAX ELEV	TWH IR NO DW	SMU	ECO CODE	M M I	M C G	I SN ID TE EX	R I PH AA RB	M LE OT GH	HM AE RT VH	PROPOSED FUTURE MANAGEMENT
744	19	1	4	TM	3.0	0.0	0.0	0.0	3.0	26.8	SOUTH	MM	5		7	12	VH	74E	WHM	2	1	100	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	2	4	TM	4.4	0.0	0.0	0.0	4.4	38.9	SOUTH	MM	4		7	12	VH	74E	WHM	2	1	100	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	3	4	TM	7.7	0.4	0.0	0.0	8.1	81.9	SOUTH	MM	4		7	10	VH	74E	WHM	2	1	100	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	4	4	TM	0.8	1.9	0.0	0.0	2.7	72.2	SOUTH	MM	3		8	11	VH	74E	WHM	2	1	100	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	5	4	TM	0.4	1.5	0.0	0.0	1.9	54.6	SOUTH	MM	4		8	11	VH	74E	WHM	2	1	100	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	6	4	TM	0.0	8.0	0.0	0.0	8.0	274.7	SOUTH	MM	4		8	11	VH	74E	WHM	2	1	100	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	7	4	TM	2.8	10.6	0.0	0.0	13.4	443.5	WEST	MM	4		8	12	VH	74E	WHM	2	1	100	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	8	4	TM	0.8	6.9	0.0	0.0	7.6	244.8	WEST	MM	4		9	12	VH	74E	WHM	2	1	100	N	RS	CC	RS,PLANT(YC),SS,CC
	19				19.9	29.3	0.0	0.0	49.2	1,237.5																
744	20	1	4	TM	22.8	0.0	0.0	0.0	22.8	200.3	WEST	MM	6		6	13	VH	74E	WHM	2	1	100	N	RS	CC	RS,PLANT(YC),SS,CC
744	20	2	4	TM	11.8	0.0	0.0	0.0	11.8	103.9	WEST	MM	5		6	12	VH	74E	WHM	2	1	100	N	RS	CC	RS,PLANT(YC),SS,CC
744	20	3	4	TM	9.1	0.0	0.0	0.0	9.1	79.7	SOUTH	MM	5		7	12	VH	74E	WHM	2	1	100	N	RS	CC	RS,PLANT(YC),SS,CC
	20				43.6	0.0	0.0	0.0	43.6	383.9																
744	21	1	4	TM	7.7	0.0	0.0	0.0	7.7	206.4	NORTH	MM	7		8	14	E	74E	WHM	2	1	100	N	HE	C2	RS,PLANT(YC),SS,CC
	21				7.7	0.0	0.0	0.0	7.7	206.4																
744	22	1	4	TM	0.6	11.2	0.0	0.0	11.7	390.7	SOUTH	MM	3		7	11	E	74D	WHM	3	1	100	N	RS	CC	RS,PLANT(YC),SS,CC
744	22	2	4	TM	0.0	9.4	0.0	0.0	9.4	324.6	SOUTH	MM	4		7	11	E	74D	WHM	3	1	100	N	RS	CC	RS,PLANT(YC),SS,CC
744	22	3	4	TM	0.0	5.2	0.0	0.0	5.2	178.1	SOUTH	MM	4		7	11	E	74D	WHM	3	1	100	N	RS	CC	RS,PLANT(YC),SS,CC
744	22	4	4	TM	0.4	2.4	0.0	0.0	2.9	88.4	SOUTH	MM	2		7	8	E	74D	WHM	3	1	100	N	RS	CC	RS,PLANT(YC),SS,CC
744	22	5	4	TM	0.1	4.1	0.0	0.0	4.3	143.9	SOUTH	MM	2		7	8	E	74D	WHM	3	1	100	N	RS	CC	RS,PLANT(YC),SS,CC
	22				1.1	32.3	0.0	0.0	33.4	1,125.6																
744	27	1	4	ML	0.0	0.0	19.5	0.0	19.5	879.1	NORTH	MM	5		6	11	VH	1E	WDC	3	1	100	N	RS	CC	RS,PLANT(YC),SS,CC
744	27	5	4	ML	0.0	0.0	1.6	0.0	1.6	72.7	NORTH	MM	5		7	10	VH	2E	WDC	2	1	100	N	RS	CC	RS,PLANT(YC),SS,CC
	27				0.0	0.0	21.1	0.0	21.1	951.8																
744	28	1	4	ML	0.0	0.0	15.1	0.0	15.1	680.9	NORTH	MO	3		4	10	E	1E	WDC	3	1	100	N	RS	CC	RS,PLANT(YC),SS,CC
	28				0.0	0.0	15.1	0.0	15.1	680.9																

VCU	HAUL RTN VIST T#	SETT IN G#	LU D	RL EU VD	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOP E	MIN ELEV	MAX ELEV	TWIR NO DW	SMU	ECO CODE	MM I	MC G	INSN ID TE EX	WET HAB	RIPH AA RB	MLE OT GH	HMAE RT VH	PROPOSED FUTURE MANAGEMENT
744	35	1	4	ML	0.0	9.7	0.0	0.0	9.7	335.7	WEST	PR	4	7	11	VH	1D	WDC	2	1	100	FNW	N	RS	CC	RS,CC
744	35	2	4	ML	0.0	5.4	0.0	0.0	5.4	186.3	NORTH	PR	4	7	11	VH	1D	WDC	2	1	100	FNW	N	RS	CC	RS,CC
744	35	3	4	ML	1.7	5.1	0.0	0.0	6.8	191.5	WEST	PR	6	9	13	VH	1D	WDC	2	1	100	FNW	N	HE	SW	RS,FH,RS,2-SW
	35				1.7	20.2	0.0	0.0	21.9	713.5																
744	38	1	4	ML	0.0	7.3	0.0	0.0	7.3	252.5	WEST	PR	4	7	12	E	1D	WDC	2	1	100	FNW	N	RS	CC	RS,CC
744	38	1	4	ML	0.0	3.4	0.0	0.0	3.4	117.9	WEST	PR	4	7	12	E	1D	WDC	2	1	100	FNW	N	HE	SW	RS,FH,RS,2-SW
	38				0.0	10.7	0.0	0.0	10.7	370.4																
744	40	1	4	ML	0.0	0.0	6.1	0.0	6.1	274.8	SOUTH	MO	3	5	8	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	40				0.0	0.0	6.1	0.0	6.1	274.8																
744	41	1	4	ML	0.0	0.0	3.3	0.0	3.3	149.3	SOUTH	MO	5	8	10	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	41	2	4	ML	0.0	0.0	7.4	0.0	7.4	334.2	SOUTH	MO	5	5	9	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	41	3	4	ML	0.0	0.0	1.6	0.0	1.6	72.4	SOUTH	MO	4	5	7	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	41				0.0	0.0	12.3	0.0	12.3	555.9																
744	47	1	4	ML	0.0	0.0	1.9	0.0	1.9	83.5	WEST	MO	3	8	10	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	47	2	4	ML	0.0	0.0	14.4	0.0	14.4	649.7	WEST	MO	4	8	13	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	47	3	4	ML	0.0	0.0	8.9	0.0	8.9	401.6	WEST	MO	4	7	12	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	47				0.0	0.0	25.2	0.0	25.2	1,134.8																
744	49	1	4	TM	0.0	0.0	14.5	0.0	14.5	655.6	NORTH	MM	4	10	10	H	4D	CMB	2	1	70	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	49	2	4	TM	0.0	0.0	12.9	0.0	12.9	583.1	NORTH	MM	5	10	10	VH	1F	WDC	3	1	100	FNW	N	RS	CC	RS,CC
744	49	3	4	TM	0.0	1.9	8.8	0.0	10.8	465.8	NORTH	MM	5	10	10	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,CC
744	49	4	4	ML	0.0	0.0	7.5	0.0	7.5	337.5	NORTH	MM	5	10	13	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,CC
	49				0.0	1.9	43.8	0.0	45.7	2,041.9																

VCU	HAU RN VI EI ST T#	SE T I N G#	L U D	RL EU VD	V O L C4	V O L C5	V O L C6	V O L C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIR NO DW	SMU	ECO CODE	MMI	MCG	ISN ID TE EX	WET HAB	RIPH AA RB	MLE OT GH	HMAE RT VH	PROPOSED FUTURE MANAGEMENT
744	51	1	4	TM	0.9	8.4	0.0	0.0	9.3	297.5	WEST	MO	4	9	16	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	51	2	4	TM	0.0	2.6	0.0	0.0	2.6	89.9	WEST	MO	4	9	16	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	51	3	4	TM	0.0	11.1	0.0	0.0	11.1	384.3	WEST	MO	4	9	16	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	51				0.9	22.1	0.0	0.0	23.0	771.7																
744	55	2	4	TM	0.0	3.2	0.0	0.0	3.2	109.6	WEST	MM	4	3	6	H	31C	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,WLPCT,CT,CT,SW
744	55	3	4	TM	0.0	6.5	0.0	0.0	6.5	223.2	WEST	MM	4	3	6	H	31C	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,WLPCT,CT,CT,SW
	55				0.0	9.6	0.0	0.0	9.6	332.8																
744	57	1	4	TM	1.0	4.9	0.0	0.0	5.9	197.6	WEST	MM	3	5	7	VH	528D	WHS	2	4	75	FNW	N	RS	CC	RS,CC
744	57	2	4	TM	0.0	7.7	0.0	0.0	7.7	265.4	WEST	MM	3	5	7	VH	528D	WHS	2	4	75	FNW	N	RS	CC	RS,CC
744	57	3	4	TM	0.1	4.5	0.0	0.0	4.6	159.6	EAST	MM	3	6	7	VH	528D	WHS	2	4	75	FNW	N	SH	CC	RS,CC
744	57	4	4	TM	0.0	12.1	0.0	0.0	12.1	417.8	WEST	MM	3	3	7	VH	1C	WDC	1	1	100	FNW	N	LS	CC	RS,CC
	57				1.2	29.2	0.0	0.0	30.4	1,040.3																
744	58	1	4	TM	5.6	0.1	0.0	0.0	5.7	122.4	WEST	MM	5	5	9	VH	528F	WHS	3	4	75	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	58	2	4	TM	5.6	6.4	0.0	0.0	12.0	376.1	WEST	MM	5	6	9	VH	528F	WHS	3	4	75	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	58				11.2	6.5	0.0	0.0	17.7	498.5																
744	59	7	4	TM	2.8	0.0	0.0	0.0	2.8	74.9	NORTH	MM	4	5	7	VH	528D	WHS	2	4	75	FNW	N	RS	CC	RS,CC
744	59	1	4	TM	7.4	0.0	0.0	0.0	7.4	203.5	WEST	MM	3	4	5	H	31C	CCD	2	1	80	FW	N	RS	CC	RS,CC
744	59	2	4	TM	2.5	0.0	0.0	0.0	2.5	69.8	NORTH	MM	2	4	5	H	20C	CMB	1	1	45	FW	N	SH	CC	RS,CC
744	59	3	4	TM	10.2	0.0	0.0	0.0	10.2	239.8	WEST	MM	2	4	6	VH	528D	WHS	2	4	75	FNW	N	RS	CC	RS,CC
744	59	4	4	TM	4.5	0.0	0.0	0.0	4.5	102.8	NORTH	MM	2	5	6	VH	528D	WHS	2	4	75	FNW	N	SH	CC	RS,CC
744	59	5	4	TM	3.4	0.0	0.0	0.0	3.4	73.1	WEST	MM	2	5	7	VH	528D	WHS	2	4	75	FNW	N	RS	CC	RS,CC
744	59	6	4	TM	6.9	0.9	0.0	0.0	7.8	222.0	NORTH	MM	2	5	7	VH	528D	WHS	2	4	75	FNW	N	RS	CC	RS,CC
	59				37.8	0.9	0.0	0.0	38.7	985.8																
744	61	1	4	TM	3.2	0.0	0.0	0.0	3.2	50.8	NORTH	MM	6	7	10	E	74D	WHM	3	1	100	FNW	N	HE	C2	RS,R&W,CC
744	61	2	4	TM	3.1	0.0	0.0	0.0	3.1	37.3	NORTH	MM	5	8	10	E	74D	WHM	3	1	100	FNW	N	HE	C2	RS,R&W,CC
744	61	3	4	TM	9.5	0.0	0.0	0.0	9.5	260.5	NORTH	MM	5	8	12	E	75F	WHS	3	4	80	FNW	N	HE	C2	RS,R&W,CC
	61				15.8	0.0	0.0	0.0	15.8	348.6																

VCU	HAU RN VI EI ST T#	SE T I N G#	L U D	RL EU VD	V O L C4	V O L C5	V O L C6	V O L C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIR NO DW	SMU	ECO CODE	MM I	MC G	INSID TE EX	WET HAB	RIPH AA RB	MLE OT GH	HMAE RT VH	PROPOSED FUTURE MANAGEMENT
744	64	1	4	TM	11.2	0.0	0.0	0.0	11.2	308.3	SOUTH	MM	6	16	20	E	75E	WHS	2	4	80	FNW	N	RS	CC	RS,CC
	64				11.2	0.0	0.0	0.0	11.2	308.3																
744	65	1	4	TM	9.0	0.0	0.0	0.0	9.0	247.9	SOUTH	MM	6	14	20	E	75E	WHS	2	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	65	2	4	TM	12.7	0.0	0.0	0.0	12.7	349.2	SOUTH	MM	6	14	20	E	75E	WHS	2	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	65	3	4	TM	4.2	0.0	0.0	0.0	4.2	116.5	SOUTH	MM	6	14	17	E	75E	WHS	2	4	80	FNW	N	RS	CC	RS,CC
744	65	4	4	TM	3.4	0.0	0.0	0.0	3.4	92.2	SOUTH	MM	6	13	15	E	75E	WHS	2	4	80	FNW	N	RS	CC	RS,CC
	65				29.3	0.0	0.0	0.0	29.3	805.8																
744	66	1	4	TM	5.0	0.0	0.0	0.0	5.0	67.0	SOUTH	MM	5	19	21	E	528E	WHS	3	4	75	FNW	N	RS	CC	RS,CC
744	66	2	4	TM	11.3	0.0	0.0	0.0	11.3	309.8	SOUTH	MM	7	15	20	E	75E	WHS	2	4	80	FNW	N	RS	CC	RS,CC
744	66	3	4	TM	9.2	0.0	0.0	0.0	9.2	185.3	SOUTH	MM	6	16	20	E	528E	WHS	3	4	75	FNW	N	RS	CC	RS,CC
744	66	4	4	TM	5.7	0.0	0.0	0.0	5.7	157.3	SOUTH	MM	8	14	18	E	75E	WHS	2	4	80	FNW	N	RS	CC	RS,CC
744	66	5	4	TM	7.3	0.0	0.0	0.0	7.3	201.5	SOUTH	MM	7	11	16	E	75E	WHS	2	4	80	FNW	N	RS	CC	RS,CC
744	66	6	4	TM	9.4	0.0	0.0	0.0	9.4	257.8	SOUTH	MM	6	10	16	E	75E	WHS	2	4	80	FNW	N	RS	CC	RS,CC
744	66	7	4	TM	4.2	0.0	0.0	0.0	4.2	90.9	SOUTH	MM	6	14	18	E	25	CMM	1	1	30	SEC	N	RS	CC	RS,PLANT(YC),SS,CC
744	66	8	4	TM	2.8	0.0	0.0	0.0	2.8	77.9	EAST	MM	8	11	15	E	528E	WHS	3	4	75	FNW	N	RS	CC	RS,CC
	66				55.0	0.0	0.0	0.0	55.0	1,347.5																
744	67	1	4	TM	5.7	0.0	0.0	0.0	5.7	156.4	WEST	MM	7	8	12	VH	74F	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	67	2	4	TM	24.1	0.0	0.0	0.0	24.1	541.7	WEST	MM	6	6	13	VH	74F	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	67	3	4	TM	10.9	0.0	0.0	0.0	10.9	208.4	WEST	MM	5	6	12	VH	74F	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	67				40.6	0.0	0.0	0.0	40.6	906.5																
744	68	1	4	TM	4.2	0.0	0.0	0.0	4.2	54.2	WEST	MM	2	5	6	H	20C	CMB	1	1	45	FW	N	LS	CC	RS,CC
	68				4.2	0.0	0.0	0.0	4.2	54.2																
744	72	1	4	TM	1.6	4.1	0.0	0.0	5.6	183.9	NORTH	MM	6	7	11	H	550E	CCD	3	1	68	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	72	2	4	TM	8.1	0.1	0.0	0.0	8.3	228.1	WEST	MM	5	7	11	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,CC
744	72	3	4	TM	5.0	0.2	0.0	0.0	5.2	144.2	WEST	MM	5	7	12	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,CC
744	72	4	4	TM	4.9	5.7	0.0	0.0	10.6	333.0	WEST	MM	6	7	14	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,CC
	72				19.6	10.1	0.0	0.0	29.7	889.1																

VCU	STAND#	GRID	UNIT	LAND VEG	RL	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	WHIRL DW	SMU	ECO CODE	MMI	MMC	INSITE TE	INSITE WET	RIPARIAN HAB	RIPARIAN AA	MEADOW OT	HMAE RT	HMAE VH	PROPOSED FUTURE MANAGEMENT
744	73	1	4	TM		0.5	9.7	0.1	0.0	10.3	343.6	WEST	MM	5	7	11	H	550E	CCD	3	1	68	FW	N	RS	CC		RS,CC
744	73	2	4	TM		0.5	7.1	0.0	0.0	7.6	248.4	WEST	MM	5	7	11	H	550E	CCD	3	1	68	FW	N	RS	CC		RS,CC
744	73	3	4	TM		3.1	2.6	0.0	0.0	5.7	116.5	WEST	MM	3	9	9	H	550E	CCD	3	1	68	FW	N	RS	CC		RS,CC
744	73	4	4	TM		2.7	9.5	0.0	0.0	12.2	350.9	NORTH	MM	5	11	11	H	550E	CCD	3	1	68	FW	N	RS	CC		RS,PLANT(YC),SS,CC
	73					6.8	28.8	0.1	0.0	35.7	1,059.4																	
744	74	1	4	TM		5.1	0.0	0.0	0.0	5.1	65.6	NORTH	MM	5	14	18	H	25	CMM	1	1	30	SEC	N	HE	SW		RS,FH,RS,2-SW
	74					5.1	0.0	0.0	0.0	5.1	65.6																	
746	111	1	4	SV		3.2	0.0	0.0	0.0	3.2	88.1	EAST	MM	3	4	5	M	25	CMM	1	1	30	SEC	N	RS	CC		RS,PLANT(YC),SS,CC
746	111	2	4	TM		4.6	0.0	0.0	0.0	4.6	125.1	EAST	MM	3	3	5	M	25	CMM	1	1	30	SEC	N	RS	CC		RS,PLANT(YC),SS,CC
	111					7.8	0.0	0.0	0.0	7.8	213.2																	
746	119	1	4	ML		5.0	0.0	0.0	0.0	5.0	137.2	EAST	MM	2	4	5	M	24D	CMC	1	1	60	SE	N	RS	CC		RS,PLANT(YC),SS,CC
	119					5.0	0.0	0.0	0.0	5.0	137.2																	
746	120	1	4	ML		12.0	8.1	0.0	0.0	20.1	610.4	EAST	MM	3	4	8	H	1D	WDC	2	1	100	FNW	N	RS	CC		RS,TMPCT,CT,CT,2-SW
	120					12.0	8.1	0.0	0.0	20.1	610.4																	
746	121	1	4	SV		0.7	4.3	0.0	0.0	5.0	154.6	WEST	PR	1	8	9	H	2D	WDC	2	1	100	FNW	N	RS	CC		RS,TMPCT,CT,CT,2-SW
	121					0.7	4.3	0.0	0.0	5.0	154.6																	
746	125	1	4	TM		3.1	0.0	0.0	0.0	3.1	65.6	EAST	MM	1	3	3	M	25	CMM	1	1	30	SEC	N	RS	CC		RS,PLANT(YC),SS,CC
	125					3.1	0.0	0.0	0.0	3.1	65.6																	
746	127	1	4	TM		8.7	0.0	0.0	0.0	8.7	202.7	NORTH	MM	1	2	4	M	25	CMM	1	1	30	SEC	N	SH	CC		RS,CC
	127					8.7	0.0	0.0	0.0	8.7	202.7																	
744	130	1	4	TM		12.9	0.0	5.9	0.0	18.7	618.9	WEST	MM	5	9	14	VH	528F	WHS	3	4	75	FNW	N	RS	CC		RS,PLANT(YC),SS,CC
744	130	2	4	TM		0.8	0.0	4.4	0.0	5.2	205.7	NORTH	MM	4	9	11	VH	528F	WHS	3	4	75	FNW	N	RS	CC		RS,PLANT(YC),SS,CC
	130					13.7	0.0	10.3	0.0	24.0	824.6																	

VCU	HAU RNVI EIST T#	SE TI NG#	L U D	RL EU VD	V O L C4	V O L C5	V O L C6	V O L C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIR NO DW	SMU	ECO CODE	MM I	MC G	IN ID TE EX	WET HAB	RI PH AA RB	ME LE OT GH	HM AE RT VH	PROPOSED FUTURE MANAGEMENT
744	131	1	4	TM	9.4	0.0	0.0	0.0	9.4	250.7	NORTH	MM	4	12	14	H	33E	CCS	3	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	131	2	4	TM	17.1	0.0	0.0	0.0	17.1	397.5	NORTH	MM	5	11	17	H	33E	CCS	3	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	131	3	4	TM	9.1	0.0	0.0	0.0	9.1	228.7	NORTH	MM	6	11	15	H	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
	131				35.7	0.0	0.0	0.0	35.7	876.9																
744	132	1	4	TM	22.7	0.0	0.0	0.0	22.7	593.3	SOUTH	MM	3	12	17	VH	74D	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	132				22.7	0.0	0.0	0.0	22.7	593.3																
744	138	1	4	TM	0.0	6.9	0.0	0.0	6.9	238.6	WEST	MO	4	5	9	VH	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	138	2	4	TM	0.0	10.1	0.0	0.0	10.1	348.2	WEST	MO	4	5	11	VH	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	138	3	4	TM	0.3	11.6	0.0	0.0	11.9	407.6	WEST	MO	4	4	10	VH	74D	WHM	3	1	100	FNW	N	LS	CC	RS,CC
	138				0.3	28.6	0.0	0.0	28.8	994.4																
					517.6	381.3	175.4	0.0	1,074.4	32,737.7																

VCU	HAU RN VI EI ST T#	SEG TRT IN G#	LU	RL EU VD	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIR NO DW	SMU	ECO CODE	MMI	MMC	ISNID TE EX	WET HAB	RIPH RB	MLE AA OT GH	HMAE RT VH	PROPOSED FUTURE MANAGEMENT
744	3	1	4	ML	0.0	0.0	3.0	0.0	3.0	136.9	WEST	MO	3	10	14	H	528D	WHS	2	4	75	FNW	N	LS	CC	RS,PLANT(YC),SS,CC
744	3	2	4	ML	0.0	0.0	8.6	0.0	8.6	387.8	NORTH	MO	6	10	15	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,CC
744	3	3	4	ML	0.0	0.0	9.5	0.0	9.5	426.3	EAST	MO	5	12	16	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,CC
744	3	4	4	ML	0.0	0.0	16.4	0.0	16.4	739.9	NORTH	MO	4	10	18	VH	2E	WDC	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	3	5	4	ML	0.0	0.0	13.6	0.0	13.6	611.1	EAST	MO	6	12	17	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,CC
744	3	6	4	ML	0.0	0.0	4.0	0.0	4.0	179.9	NORTH	MO	4	12	14	VH	2E	WDC	2	1	100	FNW	N	LS	CC	RS,CC
	3				0.0	0.0	55.0	0.0	55.0	2,482.0																
744	4	4	4	TM	0.0	7.4	1.5	0.0	8.9	323.8	WEST	MM	3	3	7	H	320D	CCD	3	1	60	FW	N	RS	CC	RS,PLANT(YC),SS,CC
744	4	5	4	TM	2.4	18.2	1.0	0.0	21.5	736.6	SOUTH	MM	3	3	6	H	320D	CCD	3	1	60	FW	N	SL	CC	RS,PLANT(YC),SS,CC
744	4	6	4	TM	3.7	1.3	0.0	0.0	5.0	121.6	SOUTH	MM	3	4	6	H	320D	CCD	3	1	60	FW	N	RS	CC	RS,PLANT(YC),SS,CC
	4				6.0	26.9	2.5	0.0	35.4	1,182.0																
744	5	7	4	TM	1.4	13.4	0.0	0.0	14.8	500.6	WEST	MM	3	5	8	H	320D	CCD	3	1	60	FW	N	LS	CC	RS,PLANT(YC),SS,CC
744	5	9	4	TM	20.7	0.4	0.0	0.0	21.1	460.1	SOUTH	MM	4	4	8	H	24E	CMC	1	1	60	SE	N	LS	CC	RS,CC
	5				22.1	13.8	0.0	0.0	35.9	960.7																
744	6	3	4	TM	12.3	0.2	0.0	0.0	12.5	339.6	WEST	MM	4	9	13	H	550E	CCD	3	1	68	FW	N	RS	CC	RS,PLANT(YC),SS,CC
744	6	4	4	TM	10.7	0.0	0.0	0.0	10.7	218.9	SOUTH	MM	4	9	13	H	25	CMM	1	1	30	SEC	N	RS	CC	RS,PLANT(YC),SS,CC
	6				22.9	0.2	0.0	0.0	23.2	558.5																
744	7	1	4	TM	7.8	28.6	0.0	0.0	36.4	1,178.5	WEST	MM	5	12	18	H	550E	CCD	3	1	68	FW	N	HE	SW	RS,FH,RS,R&W,2-SW
	7				7.8	28.6	0.0	0.0	36.4	1,178.5																
744	8	1	4	TM	0.0	7.1	0.0	0.0	7.1	244.5	WEST	MO	6	5	9	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	8	2	4	TM	0.0	11.8	0.0	0.0	11.8	407.0	WEST	MO	4	5	11	VH	1C	WDC	1	1	100	FNW	N	HE	C2	RS,CC
744	8	3	4	TM	0.0	4.4	0.0	0.0	4.4	153.1	WEST	MO	5	4	10	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	8	4	4	TM	0.0	8.2	0.0	0.0	8.2	283.9	WEST	MO	5	6	9	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	8	5	4	TM	0.0	17.1	0.0	0.0	17.1	591.3	WEST	MO	4	7	10	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	8	6	4	TM	0.0	3.9	0.0	0.0	3.9	133.1	WEST	MO	2	6	7	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	8	7	4	TM	0.0	12.5	0.0	0.0	12.5	432.7	WEST	MO	3	4	6	VH	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	8	8	4	TM	0.0	6.3	0.0	0.0	6.3	216.6	WEST	MO	3	3	5	H	31C	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,WLPCT,CT,CT,SW
744	8	9	4	TM	0.0	9.7	0.0	0.0	9.7	335.3	WEST	MO	3	2	4	H	31C	CCD	2	1	80	FW	N	SH	CC	RS,PLANT(YC),SS,WLPCT,CT,CT,SW
744	8	10	4	TM	0.0	10.9	0.0	0.0	10.9	375.5	WEST	MO	3	5	7	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
	8				0.0	91.9	0.0	0.0	91.9	3,172.9																

VCU	HAUL VISIT STRATUM #	SETT INGS	LU	DRVD	RL EU VD	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIR NO DW	SMU	ECO CODE	MM I	MM G	INID TE EX	WET HAB	RIPH AA RB	IMLE OT GH	HMAE RT VH	PROPOSED FUTURE MANAGEMENT
744	9	1 4	TM		0.0	4.7	0.0	0.0	4.7	163.7	NORTH	MM	5	7	10	E	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	9	2 4	TM		0.4	3.6	0.0	0.0	4.0	135.7	NORTH	MM	5	7	10	E	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	9	3 4	TM		1.0	5.4	0.0	0.0	6.5	215.7	NORTH	MM	5	7	10	E	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	9	4 4	TM		10.0	0.8	0.0	0.0	10.8	303.9	NORTH	MM	6	7	10	E	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	9	5 4	TM		10.2	0.0	0.0	0.0	10.2	281.2	NORTH	MM	7	6	10	E	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	9				21.6	14.6	0.0	0.0	36.3	1,100.2																
744	11	1 4	TM		0.0	4.1	2.9	0.0	7.1	275.5	EAST	MM	5	4	13	VH	19E	WHC	3	1	65	FW	N	RS	CC	RS,PLANT(YC),SS,CC
744	11	2 4	TM		0.0	3.2	1.6	0.0	4.8	184.2	EAST	MM	4	6	7	H	33E	CCS	3	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	11	3 4	TM		0.0	4.6	0.0	0.0	4.6	157.3	EAST	MM	4	4	7	H	33E	CCS	3	4	70	FIW	N	LS	CC	RS,PLANT(YC),SS,CC
744	11	4 4	TM		0.0	2.0	0.0	0.0	2.0	69.3	SOUTH	MM	6	6	7	H	33E	CCS	3	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	11	5 4	TM		4.4	5.3	0.0	0.0	9.8	305.8	EAST	MM	3	4	7	H	33E	CCS	3	4	70	FIW	N	LS	CC	RS,PLANT(YC),SS,CC
	11				4.4	19.2	4.6	0.0	28.2	992.2																
744	12	1 4	TM		0.0	32.2	2.7	0.0	34.9	1,235.4	EAST	MM	3	4	13	H	33E	CCS	3	4	70	FIW	N	HE	SW	RS,FH,RS,R&W,2-SW
	12				0.0	32.2	2.7	0.0	34.9	1,235.4																
737	14	1 4	ML		0.0	10.0	0.0	0.0	10.0	346.4	SOUTH	PR	4	6	11	H	54D	WHM	2	1	100	FNW	N	HE	SW	RS,FH,RS,R&W,2-SW
	14				0.0	10.0	0.0	0.0	10.0	346.4																
744	16	1 4	TM		14.8	0.0	0.0	0.0	14.8	408.4	SOUTH	MM	6	10	14	E	75E	WHS	2	4	80	FNW	N	RS	CC	RS,CC
744	16	2 4	TM		9.8	0.0	0.0	0.0	9.8	268.8	SOUTH	MM	5	9	11	E	75E	WHS	2	4	80	FNW	N	RS	CC	RS,CC
744	16	3 4	TM		19.7	0.0	0.0	0.0	19.7	458.1	SOUTH	MM	3	7	10	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	16	4 4	TM		11.5	0.0	0.0	0.0	11.5	225.0	SOUTH	MM	3	7	10	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	16	5 4	TM		7.2	0.0	0.0	0.0	7.2	131.4	SOUTH	MM	3	7	10	E	23	CMM	1	1	20	SES	N	RS	CC	RS,CC
744	16	7 4	TM		8.0	0.4	0.0	0.0	8.4	171.3	SOUTH	MM	2	7	11	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	16	7 4	TM		0.0	7.2	0.0	0.0	7.2	249.1	SOUTH	MM	2	7	11	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	16	8 4	TM		2.6	11.6	0.0	0.0	14.2	470.7	SOUTH	MM	3	8	11	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	16	9 4	TM		0.0	5.8	0.0	0.0	5.8	198.8	SOUTH	MM	2	8	10	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	16	10 4	TM		0.0	7.1	0.0	0.0	7.2	247.5	SOUTH	MM	2	8	10	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
	16				73.6	32.1	0.0	0.0	105.7	2,829.0																

VCU	HARVEST UNIT#	SEGMENT#	ITG#	LAND DESIG	RL VD	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIR	SMU	ECO CODE	MM I	MM G	INID TE EX	WET HAB	IRIPH AA RB	MLE OT GH	HMAE RT VH	PROPOSED FUTURE MANAGEMENT
737	17	1	4	ML	14.4	3.5	0.0	0.0	17.8	510.3	SOUTH	MO	5	13	20	H	74D	WHM	3	1	100	FNW	N	HE	SW	RS,FH,RS,R&W,2-SW
737	17	2	4	ML	0.3	18.8	0.0	0.0	19.1	651.7	SOUTH	MO	6	7	14	M	550D	CCD	3	1	70	FW	N	HE	SW	RS,FH,RS,R&W,2-SW
	17				14.7	22.3	0.0	0.0	36.9	1,162.0																
744	19	1	4	TM	3.0	0.0	0.0	0.0	3.0	26.8	SOUTH	MM	5	7	12	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	2	4	TM	4.4	0.0	0.0	0.0	4.4	38.9	SOUTH	MM	4	7	12	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	3	4	TM	7.7	0.4	0.0	0.0	8.1	81.9	SOUTH	MM	4	7	10	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	4	4	TM	0.8	1.9	0.0	0.0	2.7	72.2	SOUTH	MM	3	8	11	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	5	4	TM	0.4	1.5	0.0	0.0	1.9	54.6	SOUTH	MM	4	8	11	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	6	4	TM	0.0	8.0	0.0	0.0	8.0	274.7	SOUTH	MM	4	8	11	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	7	4	TM	2.8	10.6	0.0	0.0	13.4	443.5	WEST	MM	4	8	12	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	8	4	TM	0.8	6.9	0.0	0.0	7.6	244.8	WEST	MM	4	9	12	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	19				19.9	29.3	0.0	0.0	49.2	1,237.5																
744	20	1	4	TM	22.8	0.0	0.0	0.0	22.8	200.3	WEST	MM	6	6	13	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	20	2	4	TM	11.8	0.0	0.0	0.0	11.8	103.9	WEST	MM	5	6	12	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	20	3	4	TM	9.1	0.0	0.0	0.0	9.1	79.7	SOUTH	MM	5	7	12	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	20				43.6	0.0	0.0	0.0	43.6	383.9																
744	21	1	4	TM	7.7	0.0	0.0	0.0	7.7	206.4	NORTH	MM	7	8	14	E	74E	WHM	2	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,CC
	21				7.7	0.0	0.0	0.0	7.7	206.4																
744	22	1	4	TM	0.6	11.2	0.0	0.0	11.7	390.7	SOUTH	MM	3	7	11	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	22	2	4	TM	0.0	9.4	0.0	0.0	9.4	324.6	SOUTH	MM	4	7	11	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	22	3	4	TM	0.0	5.2	0.0	0.0	5.2	178.1	SOUTH	MM	4	7	11	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	22	4	4	TM	0.4	2.4	0.0	0.0	2.9	88.4	SOUTH	MM	2	7	8	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	22	5	4	TM	0.1	4.1	0.0	0.0	4.3	143.9	SOUTH	MM	2	7	8	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	22				1.1	32.3	0.0	0.0	33.4	1,125.6																
744	27	1	4	ML	0.0	0.0	19.5	0.0	19.5	879.1	NORTH	MM	5	6	11	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	27	5	4	ML	0.0	0.0	1.6	0.0	1.6	72.7	NORTH	MM	5	7	10	VH	1E	WDC	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	27				0.0	0.0	21.1	0.0	21.1	951.8																

VCU	HAUL ST#	SEG#	T I L U D	RL VD	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIR NO DW	SMU	ECO CODE	MMI	MC	IDTE	SNEX	WET HAB	RIPH AA	RLEOT GH	RMAE RT VH	PROPOSED FUTURE MANAGEMENT
744	28	1	4	ML	0.0	0.0	15.1	0.0	15.1	680.9	NORTH	MO	3	4	10	E	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	28				0.0	0.0	15.1	0.0	15.1	680.9																
744	29	1	4	ML	0.0	3.8	2.1	0.0	5.9	225.7	WEST	PR	5	7	10	E	1D	WDC	2	1	100	FNW	N	RS	CC	RS,CC
	29				0.0	3.8	2.1	0.0	5.9	225.7																
744	35	1	4	ML	0.0	9.7	0.0	0.0	9.7	335.7	WEST	PR	4	7	11	VH	1D	WDC	2	1	100	FNW	N	RS	CC	RS,CC
744	35	2	4	ML	0.0	5.4	0.0	0.0	5.4	186.3	NORTH	PR	4	7	11	VH	1D	WDC	2	1	100	FNW	N	RS	CC	RS,CC
744	35	3	4	ML	1.7	5.1	0.0	0.0	6.8	191.5	WEST	PR	6	9	13	VH	1D	WDC	2	1	100	FNW	N	HE	SW	RS,FH,RS,R&W,2-SW
	35				1.7	20.2	0.0	0.0	21.9	713.5																
744	38	1	4	ML	0.0	7.3	0.0	0.0	7.3	252.5	WEST	PR	4	7	12	E	1D	WDC	2	1	100	FNW	N	RS	CC	RS,CC
744	38	1	4	ML	0.0	3.4	0.0	0.0	3.4	117.9	WEST	PR	4	7	12	E	1D	WDC	2	1	100	FNW	N	HE	SW	RS,FH,RS,R&W,2-SW
	38				0.0	10.7	0.0	0.0	10.7	370.4																
744	40	1	4	ML	0.0	0.0	6.1	0.0	6.1	274.8	SOUTH	MO	3	5	8	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	40				0.0	0.0	6.1	0.0	6.1	274.8																
744	41	1	4	ML	0.0	0.0	3.3	0.0	3.3	149.3	SOUTH	MO	5	8	10	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	41	2	4	ML	0.0	0.0	7.4	0.0	7.4	334.2	SOUTH	MO	5	5	9	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	41	3	4	ML	0.0	0.0	1.6	0.0	1.6	72.4	SOUTH	MO	4	5	7	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	41				0.0	0.0	12.3	0.0	12.3	555.9																
744	47	1	4	ML	0.0	0.0	1.9	0.0	1.9	83.5	WEST	MO	3	8	10	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	47	2	4	ML	0.0	0.0	14.4	0.0	14.4	649.7	WEST	MO	4	8	13	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	47	3	4	ML	0.0	0.0	8.9	0.0	8.9	401.6	WEST	MO	4	7	12	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	47				0.0	0.0	25.2	0.0	25.2	1,134.8																
744	49	1	4	TM	0.0	0.0	14.5	0.0	14.5	655.6	NORTH	MM	4	10	10	H	4D	CMB	2	1	70	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	49	2	4	TM	0.0	0.0	12.9	0.0	12.9	583.1	NORTH	MM	5	10	10	VH	1F	WDC	3	1	100	FNW	N	RS	CC	RS,CC
744	49	3	4	TM	0.0	1.9	8.8	0.0	10.8	465.8	NORTH	MM	5	10	10	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,CC
744	49	4	4	ML	0.0	0.0	7.5	0.0	7.5	337.5	NORTH	MM	5	10	13	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,CC
	49				0.0	1.9	43.8	0.0	45.7	2,041.9																

VCU	HAU RNVI EIST T#	SETI NG#	L U D	RL EU VD	V O L C4	V O L C5	V O L C6	V O L C7	TOTAL ACRES	VOLUME MMBF	ASPECT	SLOPE	MIN ELEV	MAX ELEV	TIR NO DW	SMU	ECO CODE	MM I	MC G	I SN ID TE	WET HAB	R I PH AA	M LE OT GH	HM AE RT VH	PROPOSED FUTURE MANAGEMENT
744	55	2	4	TM	0.0	3.2	0.0	0.0	3.2	109.6	WEST	MM	4	3	6 H	31C	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,WLPCT,CT,CT,SW
744	55	3	4	TM	0.0	6.5	0.0	0.0	6.5	223.2	WEST	MM	4	3	6 H	31C	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,WLPCT,CT,CT,SW
	55				0.0	9.6	0.0	0.0	9.6	332.8															
744	57	1	4	TM	1.0	4.9	0.0	0.0	5.9	197.6	WEST	MM	3	5	7 VH	528D	WHS	2	4	75	FNW	N	RS	CC	RS,CC
744	57	2	4	TM	0.0	7.7	0.0	0.0	7.7	265.4	WEST	MM	3	5	7 VH	528D	WHS	2	4	75	FNW	N	RS	CC	RS,CC
744	57	3	4	TM	0.1	4.5	0.0	0.0	4.6	159.6	EAST	MM	3	6	7 VH	528D	WHS	2	4	75	FNW	N	SH	CC	RS,CC
744	57	4	4	TM	0.0	12.1	0.0	0.0	12.1	417.8	WEST	MM	3	3	7 VH	1C	WDC	1	1	100	FNW	N	LS	CC	RS,CC
	57				1.2	29.2	0.0	0.0	30.4	1,040.3															
744	58	1	4	TM	5.6	0.1	0.0	0.0	5.7	122.4	WEST	MM	5	5	9 VH	528F	WHS	3	4	75	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	58	2	4	TM	5.6	6.4	0.0	0.0	12.0	376.1	WEST	MM	5	6	9 VH	528F	WHS	3	4	75	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	58				11.2	6.5	0.0	0.0	17.7	498.5															
744	59	7	4	TM	2.8	0.0	0.0	0.0	2.8	74.9	WEST	MM	4	5	7 VH	528D	WHS	2	4	75	FNW	N	RS	CC	RS,CC
744	59	1	4	TM	7.4	0.0	0.0	0.0	7.4	203.5	WEST	MM	3	4	5 H	31C	CCD	2	1	80	FW	N	RS	CC	RS,CC
744	59	2	4	TM	2.5	0.0	0.0	0.0	2.5	69.8	NORTH	MM	2	4	5 H	20C	CMB	1	1	45	FW	N	SH	CC	RS,CC
744	59	3	4	TM	10.2	0.0	0.0	0.0	10.2	239.8	WEST	MM	2	4	6 VH	528D	WHS	2	4	75	FNW	N	RS	CC	RS,CC
744	59	4	4	TM	4.5	0.0	0.0	0.0	4.5	102.8	NORTH	MM	2	5	6 VH	528D	WHS	2	4	75	FNW	N	SH	CC	RS,CC
744	59	5	4	TM	3.4	0.0	0.0	0.0	3.4	73.1	WEST	MM	2	5	7 VH	528D	WHS	2	4	75	FNW	N	RS	CC	RS,CC
744	59	6	4	TM	6.9	0.9	0.0	0.0	7.8	222.0	NORTH	MM	2	5	7 VH	528D	WHS	2	4	75	FNW	N	RS	CC	RS,CC
	59				37.8	0.9	0.0	0.0	38.7	985.8															
744	61	1	4	TM	3.2	0.0	0.0	0.0	3.2	50.8	NORTH	MM	6	7	10 E	74D	WHM	3	1	100	FNW	N	HE	C2	RS,R&W,CC
744	61	2	4	TM	3.1	0.0	0.0	0.0	3.1	37.3	NORTH	MM	5	8	10 E	74D	WHM	3	1	100	FNW	N	HE	C2	RS,R&W,CC
744	61	3	4	TM	9.5	0.0	0.0	0.0	9.5	260.5	NORTH	MM	5	8	12 E	75F	WHS	3	4	80	FNW	N	HE	C2	RS,R&W,CC
	61				15.8	0.0	0.0	0.0	15.8	348.6															

VCU	HAU RNVI EIST T#	SET IN G#	L U D	RL EU VD	V O L C4	V O L C5	V O L C6	V O L C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIR NO DW	SMU	ECO CODE	MM I	MC G	I SNID TE EX	WET HAB	R I PH AA	M LE OT RB	HM AE RT GH	VH	PROPOSED FUTURE MANAGEMENT
744	66	1	4	TM 5.0	0.0	0.0	0.0	5.0	67.0	SOUTH	MM	5	19	21	E	528E	WHS	3	4	75	FNW	N	RS	CC		RS,CC
744	66	2	4	TM 11.3	0.0	0.0	0.0	11.3	309.8	SOUTH	MM	7	15	20	E	75E	WHS	2	4	80	FNW	N	RS	CC		RS,CC
744	66	3	4	TM 9.2	0.0	0.0	0.0	9.2	185.3	SOUTH	MM	6	16	20	E	528E	WHS	3	4	75	FNW	N	RS	CC		RS,CC
744	66	4	4	TM 5.7	0.0	0.0	0.0	5.7	157.3	SOUTH	MM	8	14	18	E	75E	WHS	2	4	80	FNW	N	RS	CC		RS,CC
744	66	5	4	TM 7.3	0.0	0.0	0.0	7.3	201.5	SOUTH	MM	7	11	16	E	75E	WHS	2	4	80	FNW	N	RS	CC		RS,CC
744	66	6	4	TM 9.4	0.0	0.0	0.0	9.4	257.8	SOUTH	MM	6	10	16	E	75E	WHS	2	4	80	FNW	N	RS	CC		RS,CC
744	66	7	4	TM 4.2	0.0	0.0	0.0	4.2	90.9	SOUTH	MM	6	14	18	E	25	CMM	1	1	30	SEC	N	RS	CC		RS,PLANT(YC),SS,CC
744	66	8	4	TM 2.8	0.0	0.0	0.0	2.8	77.9	EAST	MM	8	11	15	E	528E	WHS	3	4	75	FNW	N	RS	CC		RS,CC
	66			55.0	0.0	0.0	0.0	55.0	1,347.5																	
744	67	1	4	TM 5.7	0.0	0.0	0.0	5.7	156.4	WEST	MM	7	8	12	VH	74F	WHM	3	1	100	FNW	N	RS	CC		RS,PLANT(YC),SS,CC
744	67	2	4	TM 24.1	0.0	0.0	0.0	24.1	541.7	WEST	MM	6	6	13	VH	74F	WHM	3	1	100	FNW	N	RS	CC		RS,PLANT(YC),SS,CC
744	67	3	4	TM 10.9	0.0	0.0	0.0	10.9	208.4	WEST	MM	5	6	12	VH	74F	WHM	3	1	100	FNW	N	RS	CC		RS,PLANT(YC),SS,CC
	67			40.6	0.0	0.0	0.0	40.6	906.5																	
744	68	1	4	TM 4.2	0.0	0.0	0.0	4.2	54.2	WEST	MM	2	5	6	H	20C	CMB	1	1	45	FW	N	LS	CC		RS,CC
	68			4.2	0.0	0.0	0.0	4.2	54.2																	
744	72	1	4	TM 1.6	4.1	0.0	0.0	5.6	183.9	NORTH	MM	6	7	11	H	550E	CCD	3	1	68	FNW	N	RS	CC		RS,PLANT(YC),SS,CC
744	72	2	4	TM 8.1	0.1	0.0	0.0	8.3	228.1	WEST	MM	5	7	11	VH	74E	WHM	2	1	100	FNW	N	RS	CC		RS,CC
744	72	3	4	TM 5.0	0.2	0.0	0.0	5.2	144.2	WEST	MM	5	7	12	VH	74E	WHM	2	1	100	FNW	N	RS	CC		RS,CC
744	72	4	4	TM 4.9	5.7	0.0	0.0	10.6	333.0	WEST	MM	6	7	14	VH	74E	WHM	2	1	100	FNW	N	RS	CC		RS,CC
	72			19.6	10.1	0.0	0.0	29.7	889.1																	
744	73	1	4	TM 0.5	9.7	0.1	0.0	10.3	343.6	WEST	MM	5	7	11	H	550E	CCD	3	1	68	FW	N	RS	CC		RS,CC
744	73	2	4	TM 0.5	7.1	0.0	0.0	7.6	248.4	WEST	MM	5	7	11	H	550E	CCD	3	1	68	FW	N	RS	CC		RS,CC
744	73	3	4	TM 3.1	2.6	0.0	0.0	5.7	116.5	WEST	MM	3	9	9	H	550E	CCD	3	1	68	FW	N	RS	CC		RS,CC
744	73	4	4	TM 2.7	9.5	0.0	0.0	12.2	350.9	NORTH	MM	5	11	11	H	550E	CCD	3	1	68	FW	N	RS	CC		RS,PLANT(YC),SS,CC
	73			6.8	28.8	0.1	0.0	35.7	1,059.4																	
744	74	1	4	TM 5.1	0.0	0.0	0.0	5.1	65.6	NORTH	MM	5	14	18	H	25	CMM	1	1	30	SEC	N	HE	SW		RS,FH,RS,R&W,2-SW
	74			5.1	0.0	0.0	0.0	5.1	65.6																	

VCU	HAU RNVI EST T#	SET ITN G#	D	L RL EU VD	V O L C4	V O L C5	V O L C6	V O L C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWHIR NO DW	SMU	ECO CODE	MM I	MC G	ISN ID TE EX	WET HAB	RIPH AA RB	MLE OT GH	HMAE RT VH	PROPOSED FUTURE MANAGEMENT
744	77	1 4	TM		2.5	0.0	0.0	0.0	2.5	68.2	WEST	MM	5	8	11	H	33E	CCS	3	4	70	FIW	N	RS	CC	RS,CC
744	77	2 4	TM		4.7	0.0	0.0	0.0	4.7	130.3	SOUTH	MM	5	8	11	H	33E	CCS	3	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
	77				7.2	0.0	0.0	0.0	7.2	198.5																
744	81	1 4	TM		0.8	6.9	0.0	0.0	7.7	257.3	NORTH	MM	5	8	12	M	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	81	2 4	TM		0.9	9.7	0.0	0.0	10.6	354.5	WEST	MM	4	7	12	M	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	81	3 4	TM		1.2	6.0	0.0	0.0	7.2	240.5	NORTH	MM	5	9	11	M	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
	81				2.8	22.6	0.0	0.0	25.5	852.2																
744	82	1 4	TM		0.0	0.0	1.9	0.0	1.9	87.1	NORTH	MM	3	7	8	M	23	CMM	1	1	20	SES	N	RS	CC	RS,PLANT(YC),SS,CC
744	82	2 4	TM		0.0	0.0	11.2	0.0	11.2	503.8	NORTH	MM	4	6	9	M	32D	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,TMPCT,CT,CT,SW
744	82	3 4	TM		0.0	5.4	2.0	0.0	7.4	276.7	NORTH	MM	3	7	9	M	32D	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,TMPCT,CT,CT,SW
744	82	4 4	TM		0.3	3.2	0.0	0.0	3.4	111.1	NORTH	MM	3	7	8		32D	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,TMPCT,CT,CT,SW
	82				0.3	8.5	15.1	0.0	23.9	978.7																
744	83	1 4	TM		3.4	1.9	0.0	0.0	5.4	113.0	NORTH	MM	2	7	8	H	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	83	2 4	TM		5.1	0.1	0.0	0.0	5.2	102.7	EAST	MM	1	7	7	H	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	83	3 4	TM		10.8	0.0	0.0	0.0	10.8	261.4	EAST	MM	2	6	7	H	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
	83				19.3	2.0	0.0	0.0	21.3	477.2																
744	84	1 4	TM		20.6	0.0	0.0	0.0	20.6	558.2	NORTH	MM	4	12	16	H	33E	CCS	3	4	70	FIW	N	HE	SW	RS,FH,RS,R&W,2-SW
	84				20.6	0.0	0.0	0.0	20.6	558.2																
744	85	1 4	TM		7.0	42.6	0.0	0.0	49.6	1,662.7	EAST	MM	7	7	18	VH	19E	WHC	3	1	65	FW	N	HE	SW	RS,FH,RS,R&W,2-SW
	85				7.0	42.6	0.0	0.0	49.6	1,662.7																
744	86	1 4	TM		3.7	0.0	0.0	0.0	3.7	98.9	SOUTH	MM	3	4	6	H	320D	CCD	3	1	60	FW	N	RS	CC	RS,PLANT(YC),SS,CC
744	86	2 4	TM		5.9	0.0	0.0	0.0	5.9	154.2	SOUTH	MM	2	4	5	H	320D	CCD	3	1	60	FW	N	RS	CC	RS,PLANT(YC),SS,CC
744	86	3 4	TM		2.7	1.3	0.0	0.0	3.9	100.0	SOUTH	MM	1	3	4	H	320D	CCD	3	1	60	FW	N	SH	CC	RS,PLANT(YC),SS,CC
	86				12.3	1.3	0.0	0.0	13.5	353.2																

VCU	HAU RN VI ST T#	SET I N G#	L U D	RL EU VD	V O L C4	V O L C5	V O L C6	V O L C7	TOTAL ACRES	VOLUME MMBF	ASPECT	SLOP E	MIN ELEV	MAX ELEV	TWIR NO DW	SMU	ECO CODE	MM I	MC G	INID TE EX	WET HAB	IRIPH AA RB	MLE OT GH	HMAE RT VH	PROPOSED FUTURE MANAGEMENT
737	97	1	4	ML	0.0	5.7	0.0	0.0	5.7	196.9	NORTH	MO 7	20	24	H	75F	WHS	3	4	80	FNW	N	HE	SW	RS,FH,RS,R&W,2-SW
737	97	2	4	ML	0.0	6.9	0.0	0.0	6.9	237.7	NORTH	MO 5	20	24	H	75F	WHS	3	4	80	FNW	N	HE	SW	RS,FH,RS,R&W,2-SW
737	97	3	4	ML	0.0	6.0	0.0	0.0	6.0	207.4	WEST	MO 6	20	23	H	75F	WHS	3	4	80	FNW	N	HE	SW	RS,FH,RS,R&W,2-SW
	97				0.0	18.6	0.0	0.0	18.6	642.0															
737	98	1	4	ML	0.0	8.9	0.0	0.0	8.9	307.2	NORTH	MO 5	16	20	H	75F	WHS	3	4	80	FNW	N	HE	SW	RS,FH,RS,R&W,2-SW
737	98	2	4	ML	0.0	17.6	0.0	0.0	17.6	608.1	NORTH	MO 6	15	20	H	75F	WHS	3	4	80	FNW	N	HE	SW	RS,FH,RS,R&W,2-SW
	98				0.0	26.5	0.0	0.0	26.5	915.3															
737	104	1	4	ML	1.5	24.5	0.0	0.0	26.0	886.5	SOUTH	PR 6	15	22	H	74D	WHM	3	1	100	FNW	N	HE	SW	RS,FH,RS,R&W,2-SW
	104				1.5	24.5	0.0	0.0	26.0	886.5															
737	106	1	4	ML	1.5	7.1	0.0	0.0	8.6	287.1	SOUTH	MO 3	17	19	H	75F	WHS	3	4	80	FNW	N	HE	SW	RS,FH,RS,R&W,CC
737	106	2	4	ML	0.0	3.2	0.0	0.0	3.2	109.9	NORTH	MO 6	15	17	VH	75F	WHS	3	4	80	FNW	N	HE	SW	RS,FH,RS,R&W,CC
737	106	3	4	ML	0.0	3.0	0.0	0.0	3.0	104.6	WEST	MO 6	14	17	VH	75F	WHS	3	4	80	FNW	N	HE	SW	RS,FH,RS,R&W,CC
737	106	4	4	ML	0.3	6.1	0.0	0.0	6.4	219.1	WEST	MO 5	12	17	VH	75F	WHS	3	4	80	FNW	N	HE	SW	RS,FH,RS,R&W,CC
737	106	5	4	ML	1.5	11.1	0.0	0.0	12.6	424.5	SOUTH	MO 5	10	17	VH	75F	WHS	3	4	80	FNW	N	HE	SW	RS,FH,RS,R&W,CC
737	106	6	4	ML	1.3	8.3	0.0	0.0	9.6	322.2	SOUTH	MO 5	10	17	VH	75F	WHS	3	4	80	FNW	N	HE	SW	RS,FH,RS,R&W,CC
	106				4.6	38.9	0.0	0.0	43.4	1,467.4															
737	107	1	4	ML	2.6	20.1	0.0	0.0	22.7	759.6	SOUTH	MO 5	14	20	H	75F	WHS	3	4	80	FNW	N	HE	SW	RS,FH,RS,R&W,CC
	107				2.6	20.1	0.0	0.0	22.7	759.6															
737	110	1	4	TM	0.1	7.7	0.0	0.0	7.8	268.7	SOUTH	MM 3	6	8	M	24E	CMC	1	1	60	SE	N	HE	SW	RS,FH,RS,R&W,2-SW
737	110	2	4	TM	0.0	4.1	0.0	0.0	4.1	140.9	SOUTH	MM 4	6	8	H	74E	WHM	2	1	100	FNW	N	HE	SW	RS,FH,RS,R&W,2-SW
737	110	3	4	TM	0.7	4.4	0.0	0.0	5.1	159.6	SOUTH	MM 0	6	8	M	24E	CMC	1	1	60	SE	N	HE	SW	RS,FH,RS,R&W,2-SW
	110				0.7	16.2	0.0	0.0	17.0	569.3															
746	111	1	4	SV	3.2	0.0	0.0	0.0	3.2	88.1	EAST	MM 3	4	5	M	25	CMM	1	1	30	SEC	N	RS	CC	RS,PLANT(YC),SS,CC
746	111	2	4	TM	4.6	0.0	0.0	0.0	4.6	125.1	EAST	MM 3	3	5	M	25	CMM	1	1	30	SEC	N	RS	CC	RS,PLANT(YC),SS,CC
	111				7.8	0.0	0.0	0.0	7.8	213.2															

VCU	HAUNVIEIST T#	SETTING#	I	U	RL EU VD	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIRNOW	SMU	ECO CODE	MMI	MMG	INSIDTEEX	IRIPHAAHAB	MLEOTGH	HMAERTVH	PROPOSED FUTURE MANAGEMENT
746	125	1	4	TM	3.1	0.0	0.0	0.0	3.1	65.6	EAST	MM	1	3	3	M	25	CMM	1	1	30	SEC	N	RS	CC	RS,PLANT(YC),SS,CC
	125				3.1	0.0	0.0	0.0	3.1	65.6																
746	127	1	4	TM	8.7	0.0	0.0	0.0	8.7	202.7	NORTH	MM	1	2	4	M	25	CMM	1	1	30	SEC	N	SH	CC	RS,CC
	127				8.7	0.0	0.0	0.0	8.7	202.7																
744	130	1	4	TM	12.9	0.0	5.9	0.0	18.7	618.9	WEST	MM	5	9	14	VH	528F	WHS	3	4	75	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	130	2	4	TM	0.8	0.0	4.4	0.0	5.2	205.7	NORTH	MM	4	9	11	VH	528F	WHS	3	4	75	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	130				13.7	0.0	10.3	0.0	24.0	824.6																
744	131	1	4	TM	9.4	0.0	0.0	0.0	9.4	250.7	NORTH	MM	4	12	14	H	33E	CCS	3	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	131	2	4	TM	17.1	0.0	0.0	0.0	17.1	397.5	NORTH	MM	5	11	17	H	33E	CCS	3	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	131	3	4	TM	9.1	0.0	0.0	0.0	9.1	228.7	NORTH	MM	6	11	15	H	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
	131				35.7	0.0	0.0	0.0	35.7	876.9																
744	132	1	4	TM	22.7	0.0	0.0	0.0	22.7	593.3	SOUTH	MM	3	12	17	VH	74D	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	132				22.7	0.0	0.0	0.0	22.7	593.3																
744	138	1	4	TM	0.0	6.9	0.0	0.0	6.9	238.6	WEST	MO	4	5	9	VH	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	138	2	4	TM	0.0	10.1	0.0	0.0	10.1	348.2	WEST	MO	4	5	11	VH	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	138	3	4	TM	0.3	11.6	0.0	0.0	11.9	407.6	WEST	MO	4	4	10	VH	74D	WHM	3	1	100	FNW	N	LS	CC	RS,CC
	138				0.3	28.6	0.0	0.0	28.8	994.4																
744	139	1	4	TM	2.5	15.0	0.0	0.0	17.4	582.4	WEST	MM	3	5	14	H	528D	WHS	2	4	75	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	139				2.5	15.0	0.0	0.0	17.4	582.4																
744	141	1	4	ML	0.0	0.0	2.3	0.0	2.3	103.0	NORTH	MO	3	4	10	E	1E	WDC	3	1	100	FNW	N	RS	CC	RS,CC
	141				0.0	0.0	2.3	0.0	2.3	103.0																

VCU	HAUL VISIT STRATA #	SEAT TREE GRID #	INT	LAND USE	RL EU VEG	VOL CL4	VOL CL5	VOL CL6	VOL CL7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIR NO	SMU	ECO CODE	MM I	MM G	INTID TE EX	WET HAB	RIPH AA RB	RMLE OT GH	RMHMAE RT VH	PROPOSED FUTURE MANAGEMENT
744	142	2	4	ML	0.3	0.0	5.4	0.0	5.7	245.3	WEST	MO	5	10	14	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,CC
744	142	3	4	ML	0.2	0.0	5.5	0.0	5.7	251.6	NORTH	MO	5	10	13	VH	1D	WDC	2	1	100	FNW	N	RS	CC	RS,CC
744	142	4	4	ML	0.1	0.0	5.1	0.0	5.2	231.2	WEST	MO	5	13	18	VH	2E	WDC	2	1	100	FNW	N	RS	CC	RS,CC
744	142	5	4	ML	0.1	0.2	2.4	0.0	2.7	114.7	NORTH	MO	5	12	15	VH	2E	WDC	2	1	100	FNW	N	RS	CC	RS,CC
	142				0.7	0.2	18.4	0.0	19.3	842.8																
744	143	1	4	TM	0.6	4.3	0.7	0.0	5.6	186.1	SOUTH	MM	1	3	4	H	320D	CCD	3	1	60	FW	N	RS	CC	RS,CC
744	143	9	4	TM	1.7	11.0	1.2	0.0	13.9	450.0	SOUTH	MM	2	2	4	H	320D	CCD	3	1	60	FW	N	RS	CC	RS,CC
744	143	10	4	TM	0.6	0.4	1.3	0.0	2.3	80.8	WEST	MM	3	3	4	H	24D	CMC	1	1	60	SE	N	RS	CC	RS,CC
	143				2.9	15.7	3.3	0.0	21.9	716.9																
					621.5	756.5	239.9	0.0	1,617.9	50,968.2																

VCU	HAUN VIEW ST T#	SET TIN G#	L U D	RL EU VD	V O L C4	V O L C5	V O L C6	V O L C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TIR NO DW	SMU	ECO CODE	MM I	MC G	IN ID TE EX	WET HAB	RIPH AA RB	RMLE OT GH	RMHAE RT VH	PROPOSED FUTURE MANAGEMENT
744	4	4	4	TM	0.0	7.4	1.5	0.0	8.9	323.8	WEST	MM	3	3	7	H	320D	CCD	3	1	60	FW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	4	5	4	TM	2.4	18.2	1.0	0.0	21.5	736.6	SOUTH	MM	3	3	6	H	320D	CCD	3	1	60	FW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	4	6	4	TM	3.7	1.3	0.0	0.0	5.0	121.6	SOUTH	MM	3	4	6	H	320D	CCD	3	1	60	FW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
	4				6.0	26.9	2.5	0.0	35.4	1,182.0																
744	5	7	4	TM	1.4	13.4	0.0	0.0	14.8	500.6	WEST	MM	3	5	8	H	320D	CCD	3	1	60	FW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	5	9	4	TM	20.7	0.4	0.0	0.0	21.1	460.1	SOUTH	MM	4	4	8	H	24E	CMC	1	1	60	SE	N	HE	C2	RS,R&W,CC
	5				22.1	13.8	0.0	0.0	35.9	960.7																
744	8	1	4	TM	0.0	7.1	0.0	0.0	7.1	244.5	WEST	MO	6	5	9	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	8	2	4	TM	0.0	11.8	0.0	0.0	11.8	407.0	WEST	MO	4	5	11	VH	1C	WDC	1	1	100	FNW	N	HE	C2	RS,R&W,CC
744	8	3	4	TM	0.0	4.4	0.0	0.0	4.4	153.1	WEST	MO	5	4	10	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	8	4	4	TM	0.0	8.2	0.0	0.0	8.2	283.9	WEST	MO	5	6	9	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	8	5	4	TM	0.0	17.1	0.0	0.0	17.1	591.3	WEST	MO	4	7	10	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	8	6	4	TM	0.0	3.9	0.0	0.0	3.9	133.1	WEST	MO	2	6	7	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
744	8	7	4	TM	0.0	12.5	0.0	0.0	12.5	432.7	WEST	MO	3	4	6	VH	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	8	8	4	TM	0.0	6.3	0.0	0.0	6.3	216.6	WEST	MO	3	3	5	H	31C	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,WLPCT,CT,CT,SW
744	8	9	4	TM	0.0	9.7	0.0	0.0	9.7	335.3	WEST	MO	3	2	4	H	31C	CCD	2	1	80	FW	N	SH	CC	RS,PLANT(YC),SS,WLPCT,CT,CT,SW
744	8	10	4	TM	0.0	10.9	0.0	0.0	10.9	375.5	WEST	MO	3	5	7	VH	1C	WDC	1	1	100	FNW	N	RS	CC	RS,CC
	8				0.0	91.9	0.0	0.0	91.9	3,172.9																
744	9	1	4	TM	0.0	4.7	0.0	0.0	4.7	163.7	NORTH	MM	5	7	10	E	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	9	2	4	TM	0.4	3.6	0.0	0.0	4.0	135.7	NORTH	MM	5	7	10	E	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	9	3	4	TM	1.0	5.4	0.0	0.0	6.5	215.7	NORTH	MM	5	7	10	E	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	9	4	4	TM	10.0	0.8	0.0	0.0	10.8	303.9	NORTH	MM	6	7	10	E	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	9	5	4	TM	10.2	0.0	0.0	0.0	10.2	281.2	NORTH	MM	7	6	10	E	75F	WHS	3	4	80	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	9				21.6	14.6	0.0	0.0	36.3	1,100.2																
744	11	1	4	TM	0.0	4.1	2.9	0.0	7.1	275.5	EAST	MM	5	4	13	VH	19E	WHC	3	1	65	FW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	11	2	4	TM	0.0	3.2	1.6	0.0	4.8	184.2	EAST	MM	4	6	7	H	33E	CCS	3	4	70	FIW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	11	3	4	TM	0.0	4.6	0.0	0.0	4.6	157.3	EAST	MM	4	4	7	H	33E	CCS	3	4	70	FIW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	11	4	4	TM	0.0	2.0	0.0	0.0	2.0	69.3	SOUTH	MM	6	6	7	H	33E	CCS	3	4	70	FIW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	11	5	4	TM	4.4	5.3	0.0	0.0	9.8	305.8	EAST	MM	3	4	7	H	33E	CCS	3	4	70	FIW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
	11				4.4	19.2	4.6	0.0	28.2	992.2																

VCU	HAUL VIST T#	SETT IN G#	LUD	RL EU VD	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIR NO	SMU	ECO CODE	MMI	MCG	IINSID TE EX	WET HAB	RIPH AA RB	MLE OT GH	HMAE RT VH	PROPOSED FUTURE MANAGEMENT
744	12	1	4	TM	0.0	32.2	2.7	0.0	34.9	1,235.4	EAST	MM	3	4	13	H	33E	CCS	3	4	70	FIW	N	HE	SW	RS,FH,RS,R&W,2-SW
	12				0.0	32.2	2.7	0.0	34.9	1,235.4																
744	19	1	4	TM	3.0	0.0	0.0	0.0	3.0	26.8	SOUTH	MM	5	7	12	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	2	4	TM	4.4	0.0	0.0	0.0	4.4	38.9	SOUTH	MM	4	7	12	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	3	4	TM	7.7	0.4	0.0	0.0	8.1	81.9	SOUTH	MM	4	7	10	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	4	4	TM	0.8	1.9	0.0	0.0	2.7	72.2	SOUTH	MM	3	8	11	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	5	4	TM	0.4	1.5	0.0	0.0	1.9	54.6	SOUTH	MM	4	8	11	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	6	4	TM	0.0	8.0	0.0	0.0	8.0	274.7	SOUTH	MM	4	8	11	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	7	4	TM	2.8	10.6	0.0	0.0	13.4	443.5	WEST	MM	4	8	12	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	19	8	4	TM	0.8	6.9	0.0	0.0	7.6	244.8	WEST	MM	4	9	12	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	19				19.9	29.3	0.0	0.0	49.2	1,237.5																
744	20	1	4	TM	22.8	0.0	0.0	0.0	22.8	200.3	WEST	MM	6	6	13	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	20	2	4	TM	11.8	0.0	0.0	0.0	11.8	103.9	WEST	MM	5	6	12	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	20	3	4	TM	9.1	0.0	0.0	0.0	9.1	79.7	SOUTH	MM	5	7	12	VH	74E	WHM	2	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	20				43.6	0.0	0.0	0.0	43.6	383.9																
744	21	1	4	TM	7.7	0.0	0.0	0.0	7.7	206.4	NORTH	MM	7	8	14	E	74E	WHM	2	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
	21				7.7	0.0	0.0	0.0	7.7	206.4																
744	22	1	4	TM	0.6	11.2	0.0	0.0	11.7	390.7	SOUTH	MM	3	7	11	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	22	2	4	TM	0.0	9.4	0.0	0.0	9.4	324.6	SOUTH	MM	4	7	11	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	22	3	4	TM	0.0	5.2	0.0	0.0	5.2	178.1	SOUTH	MM	4	7	11	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	22	4	4	TM	0.4	2.4	0.0	0.0	2.9	88.4	SOUTH	MM	2	7	8	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	22	5	4	TM	0.1	4.1	0.0	0.0	4.3	143.9	SOUTH	MM	2	7	8	E	74D	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	22				1.1	32.3	0.0	0.0	33.4	1,125.6																
744	28	1	4	ML	0.0	0.0	15.1	0.0	15.1	680.9	NORTH	MO	3	4	10	E	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	28				0.0	0.0	15.1	0.0	15.1	680.9																
744	29	1	4	ML	0.0	3.8	2.1	0.0	5.9	225.7	WEST	PR	5	7	10	E	1D	WDC	2	1	100	FNW	N	RS	CC	RS,CC
	29				0.0	3.8	2.1	0.0	5.9	225.7																

VCU	HAUL RIVET STAND #	SETT ING #	L U D	RL EU VD	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TIMBER WHIRL NO DW	SMU	ECO CODE	MM I	MM C	INID TE EX	WET HAB	RIPH AA RB	RMLE OT GH	RMHAE RT VH	PROPOSED FUTURE MANAGEMENT
744	35	1	4	ML	0.0	9.7	0.0	0.0	9.7	335.7	WEST	PR	4	7	11	VH	1D	WDC	2	1	100	FNW	N	RS	CC	RS,CC
744	35	2	4	ML	0.0	5.4	0.0	0.0	5.4	186.3	NORTH	PR	4	7	11	VH	1D	WDC	2	1	100	FNW	N	RS	CC	RS,CC
744	35	3	4	ML	1.7	5.1	0.0	0.0	6.8	191.5	WEST	PR	6	9	13	VH	1D	WDC	2	1	100	FNW	N	HE	SW	RS,FH,RS,R&W,2-SW
	35				1.7	20.2	0.0	0.0	21.9	713.5																
744	38	1	4	ML	0.0	7.3	0.0	0.0	7.3	252.5	WEST	PR	4	7	12	E	1D	WDC	2	1	100	FNW	N	RS	CC	RS,CC
744	38	1	4	ML	0.0	3.4	0.0	0.0	3.4	117.9	WEST	PR	4	7	12	E	1D	WDC	2	1	100	FNW	N	HE	SW	RS,FH,RS,R&W,2-SW
	38				0.0	10.7	0.0	0.0	10.7	370.4																
744	40	1	4	ML	0.0	0.0	6.1	0.0	6.1	274.8	SOUTH	MO	3	5	8	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	40				0.0	0.0	6.1	0.0	6.1	274.8																
744	41	1	4	ML	0.0	0.0	3.3	0.0	3.3	149.3	SOUTH	MO	5	8	10	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	41	2	4	ML	0.0	0.0	7.4	0.0	7.4	334.2	SOUTH	MO	5	5	9	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	41	3	4	ML	0.0	0.0	1.6	0.0	1.6	72.4	SOUTH	MO	4	5	7	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	41				0.0	0.0	12.3	0.0	12.3	555.9																
744	47	1	4	ML	0.0	0.0	1.9	0.0	1.9	83.5	WEST	MO	3	8	10	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	47	2	4	ML	0.0	0.0	14.4	0.0	14.4	649.7	WEST	MO	4	8	13	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	47	3	4	ML	0.0	0.0	8.9	0.0	8.9	401.6	WEST	MO	4	7	12	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	47				0.0	0.0	25.2	0.0	25.2	1,134.8																
744	49	1	4	TM	0.0	0.0	14.5	0.0	14.5	655.6	NORTH	MM	4	10	10	H	4D	CMB	2	1	70	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	49	2	4	TM	0.0	0.0	12.9	0.0	12.9	583.1	NORTH	MM	5	10	10	VH	1F	WDC	3	1	100	FNW	N	RS	CC	RS,CC
744	49	3	4	TM	0.0	1.9	8.8	0.0	10.8	465.8	NORTH	MM	5	10	10	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,CC
744	49	4	4	ML	0.0	0.0	7.5	0.0	7.5	337.5	NORTH	MM	5	10	13	VH	1E	WDC	3	1	100	FNW	N	RS	CC	RS,CC
	49				0.0	1.9	43.8	0.0	45.7	2,041.9																
744	55	2	4	TM	0.0	3.2	0.0	0.0	3.2	109.6	WEST	MM	4	3	6	H	31C	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,WLPCT,CT,CT,SW
744	55	3	4	TM	0.0	6.5	0.0	0.0	6.5	223.2	WEST	MM	4	3	6	H	31C	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,WLPCT,CT,CT,SW
	55				0.0	9.6	0.0	0.0	9.6	332.8																

VCU	HAUL STAND#	SEL TREE#	LUMBER GRADE	DUFF	RL EU VD	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIG DW	TWIGH NO SMU	ECO CODE	MMI	MMG	INSITE TE	INSITE WET HAB	RIPH AA	RIPARIAN MLE OT	RIPARIAN HMAE RT	RIPARIAN HMAE VH	PROPOSED FUTURE MANAGEMENT
744	57	1	4	TM	1.0	4.9	0.0	0.0	5.9	197.6	WEST	MM	3	5	7	VH	528D	WHS	2	4	75	FNW	N	RS	CC		RS,CC
744	57	2	4	TM	0.0	7.7	0.0	0.0	7.7	265.4	WEST	MM	3	5	7	VH	528D	WHS	2	4	75	FNW	N	RS	CC		RS,CC
744	57	3	4	TM	0.1	4.5	0.0	0.0	4.6	159.6	EAST	MM	3	6	7	VH	528D	WHS	2	4	75	FNW	N	SH	CC		RS,CC
744	57	4	4	TM	0.0	12.1	0.0	0.0	12.1	417.8	WEST	MM	3	3	7	VH	1C	WDC	1	1	100	FNW	N	LS	CC		RS,CC
	57				1.2	29.2	0.0	0.0	30.4	1,040.3																	
744	58	1	4	TM	5.6	0.1	0.0	0.0	5.7	122.4	WEST	MM	5	5	9	VH	528F	WHS	3	4	75	FNW	N	RS	CC		RS,PLANT(YC),SS,CC
744	58	2	4	TM	5.6	6.4	0.0	0.0	12.0	376.1	WEST	MM	5	6	9	VH	528F	WHS	3	4	75	FNW	N	RS	CC		RS,PLANT(YC),SS,CC
	58				11.2	6.5	0.0	0.0	17.7	498.5																	
744	59	7	4	TM	2.8	0.0	0.0	0.0	2.8	74.9	WEST	MM	4	5	7	VH	528D	WHS	2	4	75	FNW	N	RS	CC		RS,CC
744	59	1	4	TM	7.4	0.0	0.0	0.0	7.4	203.5	WEST	MM	3	4	5	H	31C	CCD	2	1	80	FW	N	RS	CC		RS,CC
744	59	2	4	TM	2.5	0.0	0.0	0.0	2.5	69.8	NORTH	MM	2	4	5	H	20C	CMB	1	1	45	FW	N	SH	CC		RS,CC
744	59	3	4	TM	10.2	0.0	0.0	0.0	10.2	239.8	WEST	MM	2	4	6	VH	528D	WHS	2	4	75	FNW	N	RS	CC		RS,CC
744	59	4	4	TM	4.5	0.0	0.0	0.0	4.5	102.8	NORTH	MM	2	5	6	VH	528D	WHS	2	4	75	FNW	N	SH	CC		RS,CC
744	59	5	4	TM	3.4	0.0	0.0	0.0	3.4	73.1	WEST	MM	2	5	7	VH	528D	WHS	2	4	75	FNW	N	RS	CC		RS,CC
744	59	6	4	TM	6.9	0.9	0.0	0.0	7.8	222.0	NORTH	MM	2	5	7	VH	528D	WHS	2	4	75	FNW	N	RS	CC		RS,CC
	59				37.8	0.9	0.0	0.0	38.7	985.8																	
744	61	1	4	TM	3.2	0.0	0.0	0.0	3.2	50.8	NORTH	MM	6	7	10	E	74D	WHM	3	1	100	FNW	N	HE	C2		RS,R&W,CC
744	61	2	4	TM	3.1	0.0	0.0	0.0	3.1	37.3	NORTH	MM	5	8	10	E	74D	WHM	3	1	100	FNW	N	HE	C2		RS,R&W,CC
744	61	3	4	TM	9.5	0.0	0.0	0.0	9.5	260.5	NORTH	MM	5	8	12	E	75F	WHS	3	4	80	FNW	N	HE	C2		RS,R&W,CC
	61				15.8	0.0	0.0	0.0	15.8	348.6																	
744	68	1	4	TM	4.2	0.0	0.0	0.0	4.2	54.2	WEST	MM	2	5	6	H	20C	CMB	1	1	45	FW	N	LS	CC		RS,CC
	68				4.2	0.0	0.0	0.0	4.2	54.2																	
744	72	1	4	TM	1.6	4.1	0.0	0.0	5.6	183.9	NORTH	MM	6	7	11	H	550E	CCD	3	1	68	FNW	N	RS	CC		RS,PLANT(YC),SS,CC
744	72	2	4	TM	8.1	0.1	0.0	0.0	8.3	228.1	WEST	MM	5	7	11	VH	74E	WHM	2	1	100	FNW	N	RS	CC		RS,CC
744	72	3	4	TM	5.0	0.2	0.0	0.0	5.2	144.2	WEST	MM	5	7	12	VH	74E	WHM	2	1	100	FNW	N	RS	CC		RS,CC
744	72	4	4	TM	4.9	5.7	0.0	0.0	10.6	333.0	WEST	MM	6	7	14	VH	74E	WHM	2	1	100	FNW	N	RS	CC		RS,CC
	72				19.6	10.1	0.0	0.0	29.7	889.1																	

VCU	HAU RNVI EIST T#	SET TIN G#	L U D	RL EU VD	V O L C4	V O L C5	V O L C6	V O L C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIR NDW	SMU	ECO CODE	MM I	MM G	ISN ID TE EX	WET HAB	RI PH AA RB	ME LE OT GH	HM AE RT VH	PROPOSED FUTURE MANAGEMENT
744	73	1	4	TM	0.5	9.7	0.1	0.0	10.3	343.6	WEST	MM	5	7	11	H	550E	CCD	3	1	68	FW	N	RS	CC	RS,CC
744	73	2	4	TM	0.5	7.1	0.0	0.0	7.6	248.4	WEST	MM	5	7	11	H	550E	CCD	3	1	68	FW	N	RS	CC	RS,CC
744	73	3	4	TM	3.1	2.6	0.0	0.0	5.7	116.5	WEST	MM	3	9	9	H	550E	CCD	3	1	68	FW	N	RS	CC	RS,CC
744	73	4	4	TM	2.7	9.5	0.0	0.0	12.2	350.9	NORTH	MM	5	11	11	H	550E	CCD	3	1	68	FW	N	RS	CC	RS,PLANT(YC),SS,CC
	73				6.8	28.8	0.1	0.0	35.7	1,059.4																
744	74	1	4	TM	5.1	0.0	0.0	0.0	5.1	65.6	NORTH	MM	5	14	18	H	25	CMM	1	1	30	SEC	N	HE	SW	RS,FH,RS,R&W,2-SW
	74				5.1	0.0	0.0	0.0	5.1	65.6																
744	77	1	4	TM	2.5	0.0	0.0	0.0	2.5	68.2	WEST	MM	5	8	11	H	33E	CCS	3	4	70	FIW	N	RS	CC	RS,CC
744	77	2	4	TM	4.7	0.0	0.0	0.0	4.7	130.3	SOUTH	MM	5	8	11	H	33E	CCS	3	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
	77				7.2	0.0	0.0	0.0	7.2	198.5																
744	81	1	4	TM	0.8	6.9	0.0	0.0	7.7	257.3	NORTH	MM	5	8	12	M	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	81	2	4	TM	0.9	9.7	0.0	0.0	10.6	354.5	WEST	MM	4	7	12	M	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	81	3	4	TM	1.2	6.0	0.0	0.0	7.2	240.5	NORTH	MM	5	9	11	M	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
	81				2.8	22.6	0.0	0.0	25.5	852.2																
744	82	1	4	TM	0.0	0.0	1.9	0.0	1.9	87.1	NORTH	MM	3	7	8	M	23	CMM	1	1	20	SES	N	RS	CC	RS,PLANT(YC),SS,CC
744	82	2	4	TM	0.0	0.0	11.2	0.0	11.2	503.8	NORTH	MM	4	6	9	M	32D	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,TMPCT,CT,CT,SW
744	82	3	4	TM	0.0	5.4	2.0	0.0	7.4	276.7	NORTH	MM	3	7	9	M	32D	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,TMPCT,CT,CT,SW
744	82	4	4	TM	0.3	3.2	0.0	0.0	3.4	111.1	NORTH	MM	3	7	8		32D	CCD	2	1	80	FW	N	RS	CC	RS,PLANT(YC),SS,TMPCT,CT,CT,SW
	82				0.3	8.5	15.1	0.0	23.9	978.7																
744	83	1	4	TM	3.4	1.9	0.0	0.0	5.4	113.0	NORTH	MM	2	7	8	H	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	83	2	4	TM	5.1	0.1	0.0	0.0	5.2	102.7	EAST	MM	1	7	7	H	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	83	3	4	TM	10.8	0.0	0.0	0.0	10.8	261.4	EAST	MM	2	6	7	H	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
	83				19.3	2.0	0.0	0.0	21.3	477.2																
744	85	1	4	TM	7.0	42.6	0.0	0.0	49.6	1,662.7	EAST	MM	7	7	18	VH	19E	WHC	3	1	65	FW	N	HE	SW	RS,FH,RS,R&W,2-SW
	85				7.0	42.6	0.0	0.0	49.6	1,662.7																

VCU	HAUL VISIT#	SETT IN G#	LUD	RL EU VD	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWIR NO DW	SMU	ECO CODE	MMI	MMC	INSID TE EX	WET HAB	IRIAA PH RB	MLE OT GH	HMAE RT VH	PROPOSED FUTURE MANAGEMENT
744	86	1	4	TM	3.7	0.0	0.0	0.0	3.7	98.9	SOUTH	MM	3	4	6	H	320D	CCD	3	1	60	FW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	86	2	4	TM	5.9	0.0	0.0	0.0	5.9	154.2	SOUTH	MM	2	4	5	H	320D	CCD	3	1	60	FW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	86	3	4	TM	2.7	1.3	0.0	0.0	3.9	100.0	SOUTH	MM	1	3	4	H	320D	CCD	3	1	60	FW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
	86				12.3	1.3	0.0	0.0	13.5	353.2																
746	125	1	4	TM	3.1	0.0	0.0	0.0	3.1	65.6	EAST	MM	1	3	3	M	25	CMM	1	1	30	SEC	N	RS	CC	RS,PLANT(YC),SS,CC
	125				3.1	0.0	0.0	0.0	3.1	65.6																
746	127	1	4	TM	8.7	0.0	0.0	0.0	8.7	202.7	NORTH	MM	1	2	4	M	25	CMM	1	1	30	SEC	N	SH	CC	RS,CC
	127				8.7	0.0	0.0	0.0	8.7	202.7																
744	130	1	4	TM	12.9	0.0	5.9	0.0	18.7	618.9	WEST	MM	5	9	14	VH	528F	WHS	3	4	75	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
744	130	2	4	TM	0.8	0.0	4.4	0.0	5.2	205.7	NORTH	MM	4	9	11	VH	528F	WHS	3	4	75	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	130				13.7	0.0	10.3	0.0	24.0	824.6																
744	131	1	4	TM	9.4	0.0	0.0	0.0	9.4	250.7	NORTH	MM	4	12	14	H	33E	CCS	3	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	131	2	4	TM	17.1	0.0	0.0	0.0	17.1	397.5	NORTH	MM	5	11	17	H	33E	CCS	3	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
744	131	3	4	TM	9.1	0.0	0.0	0.0	9.1	228.7	NORTH	MM	6	11	15	H	33F	CCS	4	4	70	FIW	N	RS	CC	RS,PLANT(YC),SS,CC
	131				35.7	0.0	0.0	0.0	35.7	876.9																
744	132	1	4	TM	22.7	0.0	0.0	0.0	22.7	593.3	SOUTH	MM	3	12	17	VH	74D	WHM	3	1	100	FNW	N	RS	CC	RS,PLANT(YC),SS,CC
	132				22.7	0.0	0.0	0.0	22.7	593.3																
744	138	1	4	TM	0.0	6.9	0.0	0.0	6.9	238.6	WEST	MO	4	5	9	VH	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	138	2	4	TM	0.0	10.1	0.0	0.0	10.1	348.2	WEST	MO	4	5	11	VH	74D	WHM	3	1	100	FNW	N	RS	CC	RS,CC
744	138	3	4	TM	0.3	11.6	0.0	0.0	11.9	407.6	WEST	MO	4	4	10	VH	74D	WHM	3	1	100	FNW	N	LS	CC	RS,CC
	138				0.3	28.6	0.0	0.0	28.8	994.4																
744	139	1	4	TM	2.5	15.0	0.0	0.0	17.4	582.4	WEST	MM	3	5	14	H	528D	WHS	2	4	75	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
	139				2.5	15.0	0.0	0.0	17.4	582.4																

VCU	HAUNVIST#	SEITNG#	LUD	RLEUVD	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TWHIRNO	SMU	ECO CODE	MMI	MMC	INSNIDTE	WET HAB	IPAAEXRB	RLEOTGH	MHAERTVH	PROPOSED FUTURE MANAGEMENT
744	141	1	4	ML	0.0	0.0	2.3	0.0	2.3	103.0	NORTH	MO	3	4	10	E	1E	WDC	3	1	100	FNW	N	RS	CC	RS,CC
	141				0.0	0.0	2.3	0.0	2.3	103.0																
744	143	1	4	TM	0.6	4.3	0.7	0.0	5.6	186.1	SOUTH	MM	1	3	4	H	320D	CCD	3	1	60	FW	N	HE	C2	RS,R&W,CC
744	143	9	4	TM	1.7	11.0	1.2	0.0	13.9	450.0	SOUTH	MM	2	2	4	H	320D	CCD	3	1	60	FW	N	HE	C2	RS,R&W,CC
744	143	10	4	TM	0.6	0.4	1.3	0.0	2.3	80.8	WEST	MM	3	3	4	H	24D	CMC	1	1	60	SE	N	HE	C2	RS,R&W,CC
	143				2.9	15.7	3.3	0.0	21.9	716.9																
					368.4	518.3	145.4	0.0	1,032.1	32,351.6																

VCU	HAUL RIVE STAT #	SEGM	UNIT	LAND USE	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOP E	MIN ELEV	MAX ELEV	TWIR DW	SMU	ECO CODE	MMI	MMC	INSN IDTE	WET	RIPH AA	MLE OT	HMAE RT	PROPOSED FUTURE MANAGEMENT
744	1	1	4	OG	7.3	3.7	0.0	0.0	11.0	325.3	EAST	MO	4	4	8	H	33D	CCS	3	4	70	FIW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	1	2	4	OG	17.4	0.7	0.0	0.0	18.1	421.0	EAST	MO	3	4	8	H	25	CMM	1	1	30	SEC	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	1	3	4	OG	8.8	0.2	0.0	0.0	9.1	222.6	EAST	MO	4	6	9	H	25	CMM	1	1	30	SEC	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
	1				33.5	4.6	0.0	0.0	38.1	968.8																
744	8	1	4	TM	0.0	7.1	0.0	0.0	7.1	244.5	WEST	MO	6	5	9	VH	1C	WDC	1	1	100	FNW	N	HE	C2	RS,R&W,CC
744	8	2	4	TM	0.0	11.8	0.0	0.0	11.8	407.0	WEST	MO	4	5	11	VH	1C	WDC	1	1	100	FNW	N	HE	C2	RS,R&W,CC
744	8	3	4	TM	0.0	4.4	0.0	0.0	4.4	153.1	WEST	MO	5	4	10	VH	1C	WDC	1	1	100	FNW	N	HE	C2	RS,R&W,CC
744	8	4	4	TM	0.0	8.2	0.0	0.0	8.2	283.9	WEST	MO	5	6	9	VH	1C	WDC	1	1	100	FNW	N	HE	C2	RS,R&W,CC
744	8	5	4	TM	0.0	17.1	0.0	0.0	17.1	591.3	WEST	MO	4	7	10	VH	1C	WDC	1	1	100	FNW	N	HE	C2	RS,R&W,CC
744	8	6	4	TM	0.0	3.9	0.0	0.0	3.9	133.1	WEST	MO	2	6	7	VH	1C	WDC	1	1	100	FNW	N	HE	C2	RS,R&W,CC
744	8	7	4	TM	0.0	12.5	0.0	0.0	12.5	432.7	WEST	MO	3	4	6	VH	74D	WHM	3	1	100	FNW	N	HE	C2	RS,R&W,CC
744	8	8	4	TM	0.0	6.3	0.0	0.0	6.3	216.6	WEST	MO	3	3	5	H	31C	CCD	2	1	80	FW	N	HE	C2	RS,PLANT(YC),SS,WLPCT,CT,CT,SW
744	8	9	4	TM	0.0	9.7	0.0	0.0	9.7	335.3	WEST	MO	3	2	4	H	31C	CCD	2	1	80	FW	N	HE	C2	RS,PLANT(YC),SS,WLPCT,CT,CT,SW
744	8	10	4	TM	0.0	10.9	0.0	0.0	10.9	375.5	WEST	MO	3	5	7	VH	1C	WDC	1	1	100	FNW	N	HE	C2	RS,R&W,CC
	8				0.0	91.9	0.0	0.0	91.9	3,172.9																
744	18	1	4	TM	6.3	2.1	0.0	0.0	8.4	235.6	EAST	MM	6	2	9	E	550E	CCD	3	1	68	FW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	18	2	4	TM	18.3	4.6	0.0	0.0	22.9	629.3	EAST	MM	5	3	10	E	550E	CCD	3	1	68	FW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	18	3	4	TM	0.9	10.7	0.0	0.0	11.6	394.8	EAST	MM	5	3	7	E	550E	CCD	3	1	68	FW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
	18				25.5	17.3	0.0	0.0	42.9	1,259.7																
744	19	1	4	TM	3.0	0.0	0.0	0.0	3.0	26.8	SOUTH	MM	5	7	12	VH	74E	WHM	2	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	19	2	4	TM	4.4	0.0	0.0	0.0	4.4	38.9	SOUTH	MM	4	7	12	VH	74E	WHM	2	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	19	3	4	TM	7.7	0.4	0.0	0.0	8.1	81.9	SOUTH	MM	4	7	10	VH	74E	WHM	2	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	19	4	4	TM	0.8	1.9	0.0	0.0	2.7	72.2	SOUTH	MM	3	8	11	VH	74E	WHM	2	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	19	5	4	TM	0.4	1.5	0.0	0.0	1.9	54.6	SOUTH	MM	4	8	11	VH	74E	WHM	2	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	19	6	4	TM	0.0	8.0	0.0	0.0	8.0	274.7	SOUTH	MM	4	8	11	VH	74E	WHM	2	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	19	7	4	TM	2.8	10.6	0.0	0.0	13.4	443.5	WEST	MM	4	8	12	VH	74E	WHM	2	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	19	8	4	TM	0.8	6.9	0.0	0.0	7.6	244.8	WEST	MM	4	9	12	VH	74E	WHM	2	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
	19				19.9	29.3	0.0	0.0	49.2	1,237.5																
744	20	1	4	TM	22.8	0.0	0.0	0.0	22.8	200.3	WEST	MM	6	6	13	VH	74E	WHM	2	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	20	2	4	TM	11.8	0.0	0.0	0.0	11.8	103.9	WEST	MM	5	6	12	VH	74E	WHM	2	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	20	3	4	TM	9.1	0.0	0.0	0.0	9.1	79.7	SOUTH	MM	5	7	12	VH	74E	WHM	2	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
	20				43.6	0.0	0.0	0.0	43.6	383.9																

VCU	HAU RN VI EI ST T#	SE T I N G#	L U D	RL EU VD	V O L C4	V O L C5	V O L C6	V O L C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOP E	MIN ELEV	MAX ELEV	T WHIR NO DW	SMU	ECO CODE	MM I	MC G	I SN ID TE EX	R I PH AA RB	M LE OT GH	HM AE RT VH	PROPOSED FUTURE MANAGEMENT
744	21	1	4	TM	7.7	0.0	0.0	0.0	7.7	206.4	NORTH	MM	7	8	14	E	74E	WHM	2	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
	21				7.7	0.0	0.0	0.0	7.7	206.4																
744	22	1	4	TM	0.6	11.2	0.0	0.0	11.7	390.7	SOUTH	MM	3	7	11	E	74D	WHM	3	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	22	2	4	TM	0.0	9.4	0.0	0.0	9.4	324.6	SOUTH	MM	4	7	11	E	74D	WHM	3	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	22	3	4	TM	0.0	5.2	0.0	0.0	5.2	178.1	SOUTH	MM	4	7	11	E	74D	WHM	3	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	22	4	4	TM	0.4	2.4	0.0	0.0	2.9	88.4	SOUTH	MM	2	7	8	E	74D	WHM	3	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	22	5	4	TM	0.1	4.1	0.0	0.0	4.3	143.9	SOUTH	MM	2	7	8	E	74D	WHM	3	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
	22				1.1	32.3	0.0	0.0	33.4	1,125.6																
744	27	1	4	ML	0.0	0.0	19.5	0.0	19.5	879.1	NORTH	MM	5	6	11	VH	1E	WDC	3	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	27	5	4	ML	0.0	0.0	1.6	0.0	1.6	72.7	NORTH	MM	5	7	10	VH	2E	WDC	2	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
	27				0.0	0.0	21.1	0.0	21.1	951.8																
744	28	1	4	ML	0.0	0.0	15.1	0.0	15.1	680.9	NORTH	MO	3	4	10	E	1E	WDC	3	1	100	FNW	N	HE	C2	RS,PLANT(YC)SS,R&W,CC
	28				0.0	0.0	15.1	0.0	15.1	680.9																
744	35	1	4	ML	0.0	9.7	0.0	0.0	9.7	335.7	WEST	PR	4	7	11	VH	1D	WDC	2	1	100	FNW	N	HE	SW	RS,FH,RS,2-SW
744	35	2	4	ML	0.0	5.4	0.0	0.0	5.4	186.3	NORTH	PR	4	7	11	VH	1D	WDC	2	1	100	FNW	N	HE	SW	RS,FH,RS,2-SW
744	35	3	4	ML	1.7	5.1	0.0	0.0	6.8	191.5	WEST	PR	6	9	13	VH	1D	WDC	2	1	100	FNW	N	HE	SW	RS,FH,RS,2-SW
	35				1.7	20.2	0.0	0.0	21.9	713.5																
744	37	1	4	ML	6.1	20.7	0.0	0.0	26.8	767.7	WEST	MO	6	9	20	H	550D	CCD	3	1	70	FW	N	HE	SW	RS,FH,RS,2-SW
	37				6.1	20.7	0.0	0.0	26.8	767.7																
744	38	1	4	ML	0.0	7.3	0.0	0.0	7.3	252.5	WEST	PR	4	7	12	E	1D	WDC	2	1	100	FNW	N	HE	SW	RS,FH,RS,2-SW
744	38	1	4	ML	0.0	3.4	0.0	0.0	3.4	117.9	WEST	PR	4	7	12	E	1D	WDC	2	1	100	FNW	N	HE	SW	RS,FH,RS,2-SW
	38				0.0	10.7	0.0	0.0	10.7	370.4																
744	43	1	4	ML	0.0	0.0	9.2	0.0	9.2	415.3	WEST	MO	5	8	12	E	1E	WDC	3	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	43	2	4	ML	0.0	0.0	12.0	0.0	12.0	539.9	WEST	MO	5	7	12	E	1E	WDC	3	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
	43				0.0	0.0	21.2	0.0	21.2	955.2																

VCU	HAU RNVI EIST T#	SET IN G#	LU	RL EU VD	V O L C4	V O L C5	V O L C6	V O L C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOP E	MIN ELEV	MAX ELEV	TWHIR NO DW	SMU	ECO CODE	MM I	MC G	I SNID TE EX	WET HAB	RIPH AA RB	MLE OT GH	HMAE RT VH	PROPOSED FUTURE MANAGEMENT
744	49	1	4	TM	0.0	0.0	14.5	0.0	14.5	655.6	NORTH	MM	4	10	10	H	4D	CMB	2	1	70	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	49	2	4	TM	0.0	0.0	12.9	0.0	12.9	583.1	NORTH	MM	5	10	10	VH	1F	WDC	3	1	100	FNW	N	HE	C2	RS,R&W,CC
744	49	3	4	TM	0.0	1.9	8.8	0.0	10.8	465.8	NORTH	MM	5	10	10	VH	1E	WDC	3	1	100	FNW	N	HE	C2	RS,R&W,CC
744	49	4	4	ML	0.0	0.0	7.5	0.0	7.5	337.5	NORTH	MM	5	10	13	VH	1E	WDC	3	1	100	FNW	N	HE	C2	RS,R&W,CC
	49				0.0	1.9	43.8	0.0	45.7	2,041.9																
744	51	1	4	TM	0.9	8.4	0.0	0.0	9.3	297.5	WEST	MO	4	9	16	VH	1C	WDC	1	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	51	2	4	TM	0.0	2.6	0.0	0.0	2.6	89.9	WEST	MO	4	9	16	VH	1C	WDC	1	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
744	51	3	4	TM	0.0	11.1	0.0	0.0	11.1	384.3	WEST	MO	4	9	16	VH	1C	WDC	1	1	100	FNW	N	HE	C2	RS,PLANT(YC),SS,R&W,CC
	51				0.9	22.1	0.0	0.0	23.0	771.7																
744	55	2	4	TM	0.0	3.2	0.0	0.0	3.2	109.6	WEST	MM	4	3	6	H	31C	CCD	2	1	80	FW	N	HE	C2	RS,PLANT(YC),SS,WLPCT,CT,CT,SW
744	55	3	4	TM	0.0	6.5	0.0	0.0	6.5	223.2	WEST	MM	4	3	6	H	31C	CCD	2	1	80	FW	N	HE	C2	RS,PLANT(YC),SS,WLPCT,CT,CT,SW
	55				0.0	9.6	0.0	0.0	9.6	332.8																
744	90	1	4	OG	10.2	0.0	0.0	0.0	10.2	208.9	EAST	MO	4	5	9	H	25	CMM	1	1	30	SEC	N	HE	C2	RS,R&W,CC
	90				10.2	0.0	0.0	0.0	10.2	208.9																
746	111	1	4	SV	3.2	0.0	0.0	0.0	3.2	88.1	EAST	MM	3	4	5	M	25	CMM	1	1	30	SEC	N	RS	CC	RS,PLANT(YC),SS,CC
746	111	2	4	TM	4.6	0.0	0.0	0.0	4.6	125.1	EAST	MM	3	3	5	M	25	CMM	1	1	30	SEC	N	RS	CC	RS,PLANT(YC),SS,CC
	111				7.8	0.0	0.0	0.0	7.8	213.2																
746	119	1	4	ML	5.0	0.0	0.0	0.0	5.0	137.2	EAST	MM	2	4	5	M	24D	CMC	1	1	60	SE	N	RS	CC	RS,PLANT(YC),SS,CC
	119				5.0	0.0	0.0	0.0	5.0	137.2																
746	120	1	4	ML	12.0	8.1	0.0	0.0	20.1	610.4	EAST	MM	3	4	8	H	1D	WDC	2	1	100	FNW	N	RS	CC	RS,TMPCT,CT,CT,2-SW
	120				12.0	8.1	0.0	0.0	20.1	610.4																
746	121	1	4	SV	0.7	4.3	0.0	0.0	5.0	154.6	WEST	PR	1	8	9	H	2D	WDC	2	1	100	FNW	N	RS	CC	RS,TMPCT,CT,CT,2-SW
	121				0.7	4.3	0.0	0.0	5.0	154.6																

VCU	HAUL RTN VIST#	SEAT INUG#	LUD	RLEU VD	VOL C4	VOL C5	VOL C6	VOL C7	TOTAL ACRES	VOLUME MMBF	ASPECT	VQO	SLOPE	MIN ELEV	MAX ELEV	TIRNDW	SMU	ECO CODE	MMI	MCG	IIDTE EX	WET HAB	RIPAA RB	MLEOT GH	HMAERT VH	PROPOSED FUTURE MANAGEMENT
746	125	1	4	TM	3.1	0.0	0.0	0.0	3.1	65.6	EAST	MM	1	3	3	M	25	CMM	1	1	30	SEC	N	RS	CC	RS,PLANT(YC),SS,CC
	125				3.1	0.0	0.0	0.0	3.1	65.6																
746	127	1	4	TM	8.7	0.0	0.0	0.0	8.7	202.7	NORTH	MM	1	2	4	M	25	CMM	1	1	30	SEC	N	SH	CC	RS,CC
	127				8.7	0.0	0.0	0.0	8.7	202.7																
744	138	1	4	TM	0.0	6.9	0.0	0.0	6.9	238.6	WEST	MO	4	5	9	VH	74D	WHM	3	1	100	FNW	N	HE	C2	RS,R&W,CC
744	138	2	4	TM	0.0	10.1	0.0	0.0	10.1	348.2	WEST	MO	4	5	11	VH	74D	WHM	3	1	100	FNW	N	HE	C2	RS,R&W,CC
744	138	3	4	TM	0.3	11.6	0.0	0.0	11.9	407.6	WEST	MO	4	4	10	VH	74D	WHM	3	1	100	FNW	N	HE	C2	RS,R&W,CC
	138				0.3	28.6	0.0	0.0	28.8	994.4																
					187.9	301.6	101.2	0.0	590.7	18,527.8																

Appendix I

Sale Area Improvements/ KV Opportunities

Ketchikan Area

Upper Carroll Project Area

Recommended Sale Area Improvement Projects

I. ESSENTIAL REFORESTATION

A. Natural Regeneration Surveys

Objective/Justification: Monitor the occurrence of natural regeneration stocking following timber harvest. The National Forest Management Act of 1976 states that "It is the policy of Congress that all forested lands in the National Forest system shall be maintained in appropriate forest cover with species of trees, degree of stocking, rate of growth, and condition of stand designed to secure the maximum benefits of multiple use sustained yield management in accordance with land management plans".

Treatment: Stocking surveys shall be conducted three growing seasons following harvest to assure that satisfactory levels of natural stocking have been achieved as prescribed in the stocking level guides, Chapter 9, FSH 2409.17. The reporting and record keeping required to track and monitor the harvesting, regeneration, certification process is included in the regeneration survey costs.

Needs/Cost: Conduct natural regeneration stocking surveys at a direct cost of $8.50/acre. See the enclosed detailed listing of stands in need of surveys by alternative.

$8.50/acre X 1.04^{5} (1.217) = 10.34 X 1.5112(OH) = $15.63/acre

Work Summary:

Regeneration
Surveys

Alternative #2 $15.63 acre	1,996 acres	$ 31,197 cost
Alternative #3 $15.63 acre	1,074 acres	$ 16,787 cost
Alternative #5 $15.63 acre	1,618 acres	$ 25,289 cost
Alternative #6 $15.63 acre	1,032 acres	$ 16,130 cost
Alternative #7 $15.63 acre	591 acres	$ 9,237 cost

B. Cone Collection

Objective/Justification: Collect an adequate amount of tree seed from the appropriate seed zones to accomplish required artificial regeneration under this plan. All seed will be collected from phenotypically superior trees which exhibit desirable characteristics such as form, height, branch angle, resistance to insects and disease, etc. Ketchikan Area has sufficient spruce seed on hand to meet its spruce planting needs. The Area, however, lacks seed for Alaska and western redcedar planting. Planting roughly 300 acres of cedar (western redcedar and Alaska yellow cedar) in all action alternatives will require (300 AC X 300 TPA) 90,000 seedlings. Approximately 40,000 seedlings can be produced per pound of clean seed. Therefore 2.25 pounds of clean seed or 11 bushels (5 bushels/lb seed) of cones must be collected.

Treatment: Cone collections will occur in moderate or good cone collecting years based on field surveys. Collections will be done by force account crews in the fall after the cones have matured. Collection will involve identifying phenotypically superior trees, felling the tree, picking and bagging the cones, tagging the bags and transporting the cones to Petersburg where the seed will be cleaned and stored until needed. Seed collections will be stratified by seed zones to make sure the planting stock is adapted to location where it will be planted.

Needs/Cost: Collect 11 bushels of seed from the appropriate seed zones at a direct cost of $250.00/bushel.

$250.00/Bul X 1.04^2 (1.082) = $270.40 X 1.5112(OH) = $408.63/Bul

Work Summary:

Cone Collection			
All Action Alternatives	$408.63/bushel X 11 bushels	=	$ 4,494.93 cost

C. Planting

Objective/Justification: Planting will occur only on those sites where natural regeneration will not result in a fully stocked stand of desirable species within 5 years after harvest as required under the National Forest Management Act of 1976.

The requirements and guidelines for minimum acceptable stocking are listed in FSH 2409.17 Silvicultural Practices Handbook. Appendix A displays the harvest unit, acres and species to be planted on a site specific basis.

The sites to be planted fall under three general categories:

1. Floodplains and Alluvial Fans - These areas usually have deep well drained soils with poorly developed horizons due to periodic flooding. Mature stands rarely support more than 100-150 stems per acre. Species composition is primarily spruce growing on raised hummocks. Perturbation results in heavy brush (alder, salmonberry, and devils club) competition that will delay natural regeneration and suppress tree growth for a period of 20 to 50 years following harvest. The vast majority of the Tonowek and Tuxekan soil series have been excluded from harvesting in recent years. No harvest is proposed on these sites under the Upper Carroll Timber Sale. Existing sites (none have been identified) that are currently understocked will be planted with Sitka spruce.

2. Dense Brush or Inadequate Seed Source - Sparsely stocked sites with an established ground cover of dense vegetation such as salmonberry or devils club will retard stocking and growth for at least 20 years. Sites lacking a satisfactory seed source, including high elevation sites, sites adjacent to muskegs or lakes and immature stands where natural regeneration cannot be assured or even reasonably expected within 5 years after harvest. These sites will be planted with Sitka spruce.

3. Somewhat Poorly Drained to Poorly Drained Soils, Low Productivity Cedar Sites - These sites currently support decadent, low-quality sawtimber with cedar making up at least 10 percent of the canopy. Getting natural cedar regeneration on these sites is unlikely because:

   a. Cedar has limited capabilities to disperse seed over long distances from the parent tree. Alaska-cedar seed dispersion is limited to 300-400 feet.

   b. Alaska cedar is not a prolific seed producer. Cone crops are infrequent and germination rates are low.

   c. Unlike "down-south" cedar, southeast Alaska cedar display a greater degree of intolerance to shade. Local cedar is unable to regenerate under its own canopy and advance cedar reproduction is generally absent on the forest floor.

d. Low-volume cedar stands often result in heavy slash accumulation which can inhibit natural reproduction. Slash treatment is occasionally required to lower slash levels for planting ease.

Therefore, planting of western redcedar and/or Alaska-cedar to improve productivity and maintain tree species diversity, shall be addressed in the silvicultural prescription for cedar stands. "Relationship of Forest Plant Association to Soils Series...Ketchikan Area" tables, which are found in the Forest Plant Association Management Guide, Ketchikan Area, was used to identify potential sites.

Treatment: Floodplains/alluvial fans and dense shrub/inadequate seed source planting areas will be planted with 1-0 Sitka spruce stock. The low productivity/Cedar sites will be planted with 1-0 western redcedar or Alaska-cedar as specified in Appendix A. Generally a mixture of western redcedar and Alaska yellow cedar will be planted on sites below 800 feet in elevation on North and East Aspects, and below 1000 feet on South and West aspects. Cedar sites with elevations above those listed have been scheduled for Alaska yellow cedar planting only.

Needs/Cost: The direct cost of planting is $300.00 per acre. See enclosed detailed listing of stands requiring treatment/alternative.

$350.00/acre X 1.04^{5} (1.217) = $425.95 X 1.5112(OH) = $643.70/acre

Work Summary:

Planting

Alternative #2	$643.70/acre	X	305 acres = $196,329 cost
Alternative #3	$643.70/acre	X	198 acres = $127,453 cost
Alternative #5	$643.70/acre	X	226 acres = $145,476 cost
Alternative #6	$643.70/acre	X	198 acres = $127,453 cost
Alternative #7	$643.70/acre	X	141 acres = $ 90,762 cost

D. Plantation Survival Surveys

Objective/Justification: Monitor the survival and condition of planted trees one and three growing seasons following planting and certify that minimum stocking levels are achieved per NFMA.

Treatment: Establish and survey plantation survival stake rows the first and third growing seasons following planting. The third year survey will also determine the overall stocking, both planted and established natural regeneration.

Needs/Cost: First and third year survival surveys will be required at a direct cost of $14.00 per acre. See enclosed detailed listing of stands needing surveys by alternative.

$14.00/acre X 1.04^4 (1.170) = $16.38 X 1.5112(OH) = $24.75/acre

Work Summary:

Plantation Survival Surveys

Alternative #2	$24.75/acre	305 acres	$ 7,549 cost
Alternative #3	$24.75/acre	198 acres	$ 4,901 cost
Alternative #5	$24.75/acre	226 acres	$ 5,594 cost
Alternative #6	$24.75/acre	198 acres	$ 4,901 cost
Alternative #7	$24.75/acre	141 acres	$ 3,490 cost

F. Release and Weed

Objective/Justification: Remove high numbers of poor form or diseased submerchantible hemlock whips.

Soils prescriptions for units call for partial suspension on high mass movement index MMI = 3 soils during yarding operations (very high mass movement index MMI = 4 soils are no longer considered suitable). In some cases, many undesirable residuals remain standing following partial or full suspension yarding. Hemlock residuals diseased with mistletoe can re-infect the new regeneration if they are allowed to remain in the stand. Residuals are often of poor form, may contain heart rot, or are damaged during logging and therefore, rarely contribute to the volume of the new stand. When in great numbers, residuals will compete for growing space and can result in a loss in volume at the end of the next rotation.

Region 10 has no contractual requirement for the logger to sever residual trees. Removing hemlock residuals (mistletoe infected, poor form, or damaged) as part of a precommercial thinning treatment has not been very successful because of widely fluctuating funding and targets for PCT.

Treatment: Sever the hemlock residuals following harvest. As a rule, about 20 to 30 percent of the acres, which require partial or full suspension, will need the residuals severed (on certain plant associations).

Stands likely to need release and weeding are listed by alternative. A final determination will be made as part of the natural regeneration survey process.

Needs/Cost: Hemlock residuals will require severing of mistletoe infected stems at a direct cost of $200.00 per acre.

$200.00/acre X 1.04^{5} (1.217) = $243.40 X 1.5112(OH) = $367.83/acre

Work Summary:

Release and Weed

Alternative #2	$367.83/acre	107 acres	$39,358 cost
Alternative #3	$367.83/acre	7 acres	$ 2,575 cost
Alternative #5	$367.83/acre	119 acres	$43,772 cost
Alternative #6	$367.83/acre	96 acres	$35,312 cost
Alternative #7	$367.83/acre	40 acres	$14,713 cost

II. MITIGATION

A. Debris Slides Stabilization and Rehabilitation and Debris Slide Rehabilitation Monitoring

Objective/Justification: Stabilize and rehabilitate harvest-activity initiated landslides within units and along roads which are no longer the responsibility of the purchaser to treat.

Approximately one debris slide, 5 acres or larger, occurs for every 2,240 harvested acres Tongass wide (DEIS Tongass Land Management Plan Revision, June 1990). If slides smaller than 5 acres are included, than the number of debris slides occurring for every 2,240 harvested acres would increase one and one half fold. Average size of slides on the Ketchikan Area are 5 acres (Loggy 1974).

The majority of these slides normally occur within a 5 to 10 year period after cutting or roading from the following combined impacts:

1. Over steepen side slopes,
2. Storms with high wind and /or intensive rain fall, and
3. Where roots of severed trees have lost their holding strength in 3 to 5 years.

Approximately 591 to 1,996 acres are proposed for harvest this period. This would equate to .26 to .89 natural slides and slides with harvest. At 5 acres per slide this would equate to 1.3 to 4.5 acres of soil disturbance that would need stabilizing and rehabilitation.

Treatment: Slides that have occurred will be rehabilitated with introduced grasses and/or herbaceous vegetation. Follow up monitoring will be done for two (2) years after initial rehabilitation to insure stabilization has been accomplished.

The treatment is to stabilize surface soil erosion to prevent or reduce further sediment introduction into streams and/or lost in soil productivity of the remaining soil on the slide trace.

Needs/Cost: Stabilize up to 4.5 acres of landslides at a direct cost of $2000 per acre. Monitor each stabilized landslide for 2 years after initiation stabilization at $500 per slide, per year.

$2,000/ac. X 1.04^{6} (1.265) = 2,530.64 X 1.5112(OH) = $3,823.34/ac.

$500/ea. X 1.04^{6} (1.265) = 632.66 X 1.5112(OH) = $956.08/Slide

Work Summary: All Alternatives use 1 slide and 4.5 acre estimate.

Slide Rehabilitation	$3,823/acre	4.5 acres	$ 17,204 cost
Monitor stabilized	$ 956/slide	1.0 slides	$ 956 cost

B. Soil Stability/Wildlife Seeding of Roads - 35 Acres

Objective/Justification: This project is consistent with Regional and Forest direction to maintain or enhance wildlife habitat capability. The FEIS prescribed wildlife seeding as a mitigation measure.

The objective is to increase forage production within and adjacent to harvest units to benefit Sitka Black-tailed Deer, Black Bear, Blue Grouse, Dusky and Vancouver Canada Geese, and successional nongame birds. A secondary objective would be to minimize sedimentation and inhibit alder regrowth.

Treatment: Timber purchasers are responsible for seeding all temporary roads and landings used during the sale. However, we anticipate that there will be some seeding failures. Therefore, treatment will include re-seeding of temporary roads, and landings where initial seeding attempts failed; and seeding specified roads, which have been closed to vehicle access. Seed mixture will contain birds-foot Trefoil 12#/ac, Vetch 12#/ac, Panic Grass 8#/ac, Reed Canary Grass 8#/ac, and Alta Fescue 6#/ac, or a mixture of other plants.

System roads designated for closure and wildlife forage seeding are displayed in the Upper Carroll FEIS under transportation.

Needs/Costs: The direct cost for hand seeding is $500 per ac.

$500/acre X 1.04^{2} (1.082) = $540.80/acre X 1.5112(OH) = $817/acre

Approximately 35 acres will be treated under most of the action alternatives.

Work Summary:

Wildlife Seeding	$817/acre	35 acres	$28,595.00 cost

KV Cost Breakdown Table

Project Name	Personnel Includes Contract Prep and Administration	Subsistence	Travel - FW, Helicopter, Boat, Vehicle, other	Other - Facilities, Equipment, Contracts, etc.	Rate (Cost/Unit) Total Expenses
I. ESSENTIAL REFORESTATION					
A. Natural Regeneration Surveys (3 & 5 Years)	$ 4.88/Ac. 2/	$ 0.48	$ 0.64	$ 2.50 3/	$ 8.50/Acre
B. Cone Collection	$184.00/Bushel	$ 0.00	$13.00	$ 53.00	$250.00/Bushel
C. Planting	$ 74.00/Ac.	$ 0.00	$53.00 4/	$223.00 5/	$350.00/Acre
D. Plantation Survival Surveys (1 & 3 Years)	$ 8.00/Ac.	$ 0.48	$ 4.02	$ 1.50	$ 14.00/Acre
E. Release & Weeding (Dwarf Mistletoe Sanitation)	$ 84.00/Ac.	$ 0.00	$ 0.00	$116.00 (contract)	$200.00/Acre
II. MITIGATION					
A. Slide Stabilization Plus 2 Year Monitoring	$333.00/Ac. $333.00/Slide		(Helicopter) $1,417.00 $125.00	(Seed & Fert.) $250.00 $ 42.00	$2,000/Acre $ 500/Slide
B. Wildlife Road Seeding	$318.00/Ac.		$ 32.00	$150.00	$ 500/Acre

1/ A 15% facilities support charge not included in overhead calulations has been assigned here.
2/ Includes office and field work associated with surveys, plus database updates & record keeping.
3/ The prorated cost of reprocuring aerial photography necessary during the regeneration process & database updates
4/ Includes the cost of personnel travel and transportation of the seedlings.
5/ Includes the cost of the planting contract, seedlings, coolers, and other facilities.

UPPER CARROLL PROJECT AREA
PROPOSED ESSENTIAL REFORESTATION PROJECTS

ALTERNATIVE 2

UNIT NUMBER	UNIT ACRES	TREE PLANTING	SURVIVAL SURVEYS	RELEASE & WEED	REGENERATION SURVEYS
1	38.1	10.7	10.7	0.0	38.1
5	35.9	15.0	15.0	0.0	35.9
6	23.2	8.0	8.0	0.0	23.2
7	36.4	0.0	0.0	12.1	36.4
8	91.9	13.0	13.0	0.0	91.9
9	36.3	22.6	22.6	0.0	36.3
11	28.2	5.0	5.0	0.0	28.2
12	34.9	0.0	0.0	11.6	34.9
13	37.2	0.0	0.0	0.0	37.2
14	10.0	0.0	0.0	3.3	10.0
16	105.7	0.0	0.0	0.0	105.7
17	36.9	0.0	0.0	12.3	36.9
18	42.9	6.0	6.0	0.0	42.9
19	49.2	21.1	21.1	0.0	49.2
20	43.6	6.0	6.0	0.0	43.6
21	7.7	7.0	7.0	0.0	7.7
22	33.4	15.3	15.3	0.0	33.4
24	30.0	3.0	3.0	0.0	30.0
28	15.1	3.0	3.0	0.0	15.1
29	5.9	0.0	0.0	0.0	5.9
30	20.2	0.0	0.0	0.0	20.2
35	21.9	0.0	0.0	0.0	21.9
37	26.8	0.0	0.0	8.9	26.8
41	12.3	3.0	3.0	0.0	12.3
47	25.2	3.0	3.0	0.0	25.2
48	11.7	0.0	0.0	0.0	11.7
49	45.7	10.0	10.0	0.0	45.7
51	23.0	23.0	23.0	0.0	23.0
52	48.0	5.0	5.0	0.0	48.0
53	33.4	6.0	6.0	0.0	33.4
55	9.6	6.0	6.0	0.0	9.6
57	30.4	0.0	0.0	0.0	30.4
59	38.7	0.0	0.0	0.0	38.7
61	15.8	0.0	0.0	0.0	15.8
62	44.2	0.0	0.0	14.7	44.2
66	55.0	3.0	3.0	0.0	55.0
67	40.6	5.3	5.3	0.0	40.6
68	4.2	0.0	0.0	0.0	4.2
72	29.7	3.0	3.0	0.0	29.7
73	35.7	3.0	3.0	0.0	35.7

UPPER CARROLL PROJECT AREA
PROPOSED ESSENTIAL REFORESTATION PROJECTS

ALTERNATIVE 2

UNIT NUMBER	UNIT ACRES	TREE PLANTING	SURVIVAL SURVEYS	RELEASE & WEED	REGENERATION SURVEYS
74	5.1	0.0	0.0	0.0	5.1
76	29.8	3.0	3.0	0.0	29.8
77	7.2	1.0	1.0	0.0	7.2
81	25.5	6.0	6.0	0.0	25.5
82	23.9	4.0	4.0	0.0	23.9
83	21.3	3.0	3.0	0.0	21.3
84	20.6	0.0	0.0	6.9	20.6
85	49.6	0.0	0.0	16.5	49.6
86	13.5	3.0	3.0	0.0	13.5
90	10.2	0.0	0.0	0.0	10.2
92	66.5	12.0	12.0	0.0	66.5
93	41.4	8.0	8.0	0.0	41.4
95	19.6	3.0	3.0	0.0	19.6
97	18.6	3.0	3.0	0.0	18.6
98	26.5	2.7	2.7	0.0	26.5
104	26.0	0.0	0.0	8.7	26.0
106	43.4	10.0	10.0	0.0	43.4
107	22.7	0.0	0.0	7.6	22.7
110	17.0	4.0	4.0	0.0	17.0
111	7.8	4.0	4.0	0.0	7.8
119	5.0	3.0	3.0	0.0	5.0
120	20.1	0.0	0.0	0.0	20.1
121	5.0	0.0	0.0	0.0	5.0
125	3.1	4.0	4.0	0.0	3.1
127	8.7	0.0	0.0	0.0	8.7
130	24.0	6.0	6.0	0.0	24.0
131	35.7	8.0	8.0	0.0	35.7
132	22.7	8.0	8.0	0.0	22.7
133	12.2	0.0	0.0	4.1	12.2
138	28.8	0.0	0.0	0.0	28.8
139	17.4	3.0	3.0	0.0	17.4
141	2.3	0.0	0.0	0.0	2.3
	1,996.0	304.7	304.7	106.7	1,996.0

UPPER CARROLL PROJECT AREA
PROPOSED ESSENTIAL REFORESTATION PROJECTS

ALTERNATIVE 3

UNIT NUMBER	UNIT ACRES	TREE PLANTING	SURVIVAL SURVEYS	RELEASE & WEED	REGENERATION SURVEYS
3	41.5	4.0	4.0	0.0	41.5
8	91.9	13.0	13.0	3.9	91.9
9	36.3	22.6	22.6	0.0	36.3
16	105.7	0.0	0.0	0.0	105.7
19	49.2	21.1	21.1	0.0	49.2
20	43.6	6.0	6.0	0.0	43.6
21	7.7	7.0	7.0	0.0	7.7
22	33.4	15.3	15.3	0.0	33.4
27	21.1	5.0	5.0	0.0	21.1
28	15.1	3.0	3.0	0.0	15.1
35	21.9	0.0	0.0	0.0	21.9
38	10.7	0.0	0.0	0.0	10.7
40	6.1	3.0	3.0	0.0	6.1
41	12.3	3.0	3.0	0.0	12.3
47	25.2	3.0	3.0	0.0	25.2
49	45.7	10.0	10.0	0.0	45.7
51	23.0	23.0	23.0	0.0	23.0
55	9.6	6.0	6.0	0.0	9.6
57	30.4	0.0	0.0	0.0	30.4
58	17.7	3.0	3.0	0.0	17.7
59	38.7	0.0	0.0	0.0	38.7
61	15.8	0.0	0.0	3.2	15.8
65	29.3	3.0	3.0	0.0	29.3
66	55.0	3.0	3.0	0.0	55.0
67	40.6	5.3	5.3	0.0	40.6
68	4.2	0.0	0.0	0.0	4.2
72	29.7	3.0	3.0	0.0	29.7
73	35.7	3.0	3.0	0.0	35.7
74	5.1	0.0	0.0	0.0	5.1
111	7.8	4.0	4.0	0.0	7.8
119	5.0	3.0	3.0	0.0	5.0
120	20.1	0.0	0.0	0.0	20.1
121	5.0	0.0	0.0	0.0	5.0

UPPER CARROLL PROJECT AREA
PROPOSED ESSENTIAL REFORESTATION PROJECTS

ALTERNATIVE 3

UNIT NUMBER	UNIT ACRES	TREE PLANTING	SURVIVAL SURVEYS	RELEASE & WEED	REGENERATION SURVEYS
125	3.1	4.0	4.0	0.0	3.1
127	8.7	0.0	0.0	0.0	8.7
130	24.0	6.0	6.0	0.0	24.0
131	35.7	8.0	8.0	0.0	35.7
132	22.7	8.0	8.0	0.0	22.7
138	28.8	0.0	0.0	0.0	28.8
	1,074.4	198.3	198.3	7.1	1,074.4

UPPER CARROLL PROJECT AREA
PROPOSED ESSENTIAL REFORESTATION PROJECTS

ALTERNATIVE 5

UNIT NUMBER	UNIT ACRES	TREE PLANTING	SURVIVAL SURVEYS	RELEASE & WEED	REGENERATION SURVEYS
3	55.0	3.0	3.0	0.0	55.0
4	35.4	10.0	10.0	0.0	35.4
5	35.9	15.0	15.0	0.0	35.9
6	23.2	8.0	8.0	0.0	23.2
7	36.4	0.0	0.0	12.1	36.4
8	91.9	13.0	13.0	3.9	91.9
9	36.3	22.6	22.6	0.0	36.3
11	28.2	5.0	5.0	0.0	28.2
12	34.9	0.0	0.0	11.6	34.9
14	10.0	0.0	0.0	3.3	10.0
16	105.7	0.0	0.0	0.0	105.7
17	36.9	0.0	0.0	12.3	36.9
19	49.2	21.1	21.1	0.0	49.2
20	43.6	6.0	6.0	0.0	43.6
21	7.7	7.0	7.0	0.0	7.7
22	33.4	15.3	15.3	0.0	33.4
27	21.1	5.0	5.0	0.0	21.1
28	15.1	3.0	3.0	0.0	15.1
29	5.9	0.0	0.0	0.0	5.9
35	21.9	0.0	0.0	0.0	21.9
38	10.7	0.0	0.0	1.1	10.7
40	6.1	3.0	3.0	0.0	6.1
41	12.3	3.0	3.0	0.0	12.3
47	25.2	3.0	3.0	0.0	25.2
49	45.7	10.0	10.0	0.0	45.7
55	9.6	6.0	6.0	0.0	9.6
57	30.4	0.0	0.0	0.0	30.4
58	17.7	3.0	3.0	0.0	17.7
59	38.7	0.0	0.0	0.0	38.7
61	15.8	0.0	0.0	0.0	15.8
66	55.0	3.0	3.0	0.0	55.0
67	40.6	5.3	5.3	0.0	40.6
68	4.2	0.0	0.0	0.0	4.2
72	29.7	3.0	3.0	0.0	29.7
73	35.7	3.0	3.0	0.0	35.7
74	5.1	0.0	0.0	0.0	5.1
77	7.2	1.0	1.0	0.0	7.2
81	25.5	6.0	6.0	0.0	25.5

UPPER CARROLL PROJECT AREA
PROPOSED ESSENTIAL REFORESTATION PROJECTS

ALTERNATIVE 5

UNIT NUMBER	UNIT ACRES	TREE PLANTING	SURVIVAL SURVEYS	RELEASE & WEED	REGENERATION SURVEYS
82	23.9	4.0	4.0	0.0	23.9
83	21.3	3.0	3.0	0.0	21.3
84	20.6	0.0	0.0	6.9	20.6
85	49.6	0.0	0.0	16.5	49.6
86	13.5	3.0	3.0	0.0	13.5
97	18.6	0.0	0.0	6.2	18.6
98	26.5	0.0	0.0	8.8	26.5
104	26.0	0.0	0.0	8.7	26.0
106	43.4	0.0	0.0	14.5	43.4
107	22.7	0.0	0.0	7.6	22.7
110	17.0	0.0	0.0	5.7	17.0
111	7.8	4.0	4.0	0.0	7.8
125	3.1	4.0	4.0	0.0	3.1
127	8.7	0.0	0.0	0.0	8.7
130	24.0	6.0	6.0	0.0	24.0
131	35.7	8.0	8.0	0.0	35.7
132	22.7	8.0	8.0	0.0	22.7
138	28.8	0.0	0.0	0.0	28.8
139	17.4	3.0	3.0	0.0	17.4
141	2.3	0.0	0.0	0.0	2.3
142	19.3	0.0	0.0	0.0	19.3
143	21.9	0.0	0.0	0.0	21.9
	1,617.9	226.3	226.3	119.2	1,617.9

UPPER CARROLL PROJECT AREA
PROPOSED ESSENTIAL REFORESTATION PROJECTS

ALTERNATIVE 6

UNIT NUMBER	UNIT ACRES	TREE PLANTING	SURVIVAL SURVEYS	RELEASE & WEED	REGENERATION SURVEYS
4	35.4	10.0	10.0	11.8	35.4
5	35.9	15.0	15.0	12.0	35.9
8	91.9	13.0	13.0	3.9	91.9
9	36.3	22.6	22.6	0.0	36.3
11	28.2	5.0	5.0	9.4	28.2
12	34.9	0.0	0.0	11.6	34.9
19	49.2	21.1	21.1	0.0	49.2
20	43.6	6.0	6.0	0.0	43.6
21	7.7	7.0	7.0	2.6	7.7
22	33.4	15.3	15.3	0.0	33.4
28	15.1	3.0	3.0	0.0	15.1
29	5.9	0.0	0.0	0.0	5.9
35	21.9	0.0	0.0	2.3	21.9
38	10.7	0.0	0.0	1.1	10.7
40	6.1	3.0	3.0	0.0	6.1
41	12.3	3.0	3.0	0.0	12.3
47	25.2	3.0	3.0	0.0	25.2
49	45.7	10.0	10.0	0.0	45.7
55	9.6	6.0	6.0	0.0	9.6
57	30.4	0.0	0.0	0.0	30.4
58	17.7	3.0	3.0	0.0	17.7
59	38.7	0.0	0.0	0.0	38.7
61	15.8	0.0	0.0	5.3	15.8
68	4.2	0.0	0.0	0.0	4.2
72	29.7	3.0	3.0	0.0	29.7
73	35.7	3.0	3.0	0.0	35.7
74	5.1	0.0	0.0	1.7	5.1
77	7.2	1.0	1.0	0.0	7.2
81	25.5	6.0	6.0	0.0	25.5
82	23.9	4.0	4.0	0.0	23.9
83	21.3	3.0	3.0	0.0	21.3
85	49.6	0.0	0.0	16.5	49.6
86	13.5	3.0	3.0	4.5	13.5
125	3.1	4.0	4.0	0.0	3.1
127	8.7	0.0	0.0	0.0	8.7
130	24.0	6.0	6.0	0.0	24.0
131	35.7	8.0	8.0	0.0	35.7
132	22.7	8.0	8.0	0.0	22.7

UPPER CARROLL PROJECT AREA
PROPOSED ESSENTIAL REFORESTATION PROJECTS

ALTERNATIVE 6

UNIT NUMBER	UNIT ACRES	TREE PLANTING	SURVIVAL SURVEYS	RELEASE & WEED	REGENERATION SURVEYS
138	28.8	0.0	0.0	0.0	28.8
139	17.4	3.0	3.0	5.8	17.4
141	2.3	0.0	0.0	0.0	2.3
143	21.9	0.0	0.0	7.3	21.9
	1,032.1	198.0	198.0	95.7	1,032.1

UPPER CARROLL PROJECT AREA
PROPOSED ESSENTIAL REFORESTATION PROJECTS

ALTERNATIVE 7

UNIT NUMBER	UNIT ACRES	TREE PLANTING	SURVIVAL SURVEYS	RELEASE & WEED	REGENERATION SURVEYS
1	38.1	10.7	10.7	12.7	38.1
8	91.9	13.0	13.0	3.9	91.9
18	42.9	6.0	6.0	14.3	42.9
19	49.2	21.1	21.1	0.0	49.2
20	43.6	6.0	6.0	0.0	43.6
21	7.7	7.0	7.0	0.0	7.7
22	33.4	15.3	15.3	0.0	33.4
27	21.1	5.0	5.0	0.0	21.1
28	15.1	3.0	3.0	0.0	15.1
35	21.9	0.0	0.0	0.0	21.9
37	26.8	1.0	1.0	8.9	26.8
38	10.7	0.0	0.0	0.0	10.7
43	21.2	3.0	3.0	0.0	21.2
49	45.7	10.0	10.0	0.0	45.7
51	23.0	23.0	23.0	0.0	23.0
55	9.6	6.0	6.0	0.0	9.6
90	10.2	0.0	0.0	0.0	10.2
111	7.8	4.0	4.0	0.0	7.8
119	5.0	3.0	3.0	0.0	5.0
120	20.1	0.0	0.0	0.0	20.1
121	5.0	0.0	0.0	0.0	5.0
125	3.1	4.0	4.0	0.0	3.1
127	8.7	0.0	0.0	0.0	8.7
138	28.8	0.0	0.0	0.0	28.8
	590.7	141.1	141.1	39.8	590.7

Appendix J

Deer Availability/ Deer Demand Maps

Deer Demand as a Percentage of Deer Supply: 1990 and 2040

SOURCE: ADF&G Division of Subsistence, Toss Analysis Maps, Chatham Area GIS

Figure 3-47 cont.
1990 Deer Demand as a Percentage of Deer Supply



Note: This map displays deer demand (projected harvest) as a percentage of the 1990 deer supply (10% of the habitat capability) for each Wildlife Analysis Area (WAA). Areas where demand for deer exceeds 120 percent of the WAA supply, indicate that existing deer habitat is not sufficient to sustain present harvest levels. Harvest data is from Alaska Dept. of Fish and Game (ADF&G) 1987- 1990 deer hunter surveys; deer habitat capability estimates are from the Tongass Land Management Plan Revision (TLMP).
Source: ADF&G Div. of Subsistence Food Analysis Map III, Chatham Area

Figure 3-48 cont.
2040 Projected Deer Demand as a Percentage of Deer Supply



Deer Demand less than or equal to 40% of Deer Supply
Deer Demand greater than 40% but less than or equal to 80% of Deer Supply
Deer Demand greater than 80% but less than or equal to 120% of Deer Supply
Deer Demand greater than 120% but less than or equal to 160% of Deer Supply
Deer Demand greater than 160% but less than or equal to 200% of Deer Supply
Deer Demand greater than 200% but less than or equal to 240% of Deer Supply
Deer Demand greater than 240% of Deer Supply

Note: This map assumes deer demand (1987-90 mean harvest) versus deer supply (10% of habitat capability) 50 years from now for each Wildlife Analysis Area (WAA). Demand is assumed to increase with projected population growth at 12% per decade through 2010 and 15% per decade through 2040. Areas where demand for deer exceeds 20 percent of the WAA supply, indicate that existing deer habitat is not sufficient to sustain present harvest areas. Harvest data is from Alaska Dept. of Fish and Game (ADF&G) 1987- 1990 deer hunter surveys; deer habitat capability estimates are from the Tongass Land Management Plan Revision (TLMP).
Source: ADF&G Div. of Subsistence Food Analysis Map 12, Chatham Area GIS.

Appendix K

Part 1 - Unit Cards

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 1 **Planned Acres:** 38.1 **Estimated Volume:** 968.8 **In Alternatives:** 2 , 0 , 0 , 0 , 7
Silvicultural System : See section **Number of Settings:** 3 **Quad:** KTNC5NE **Photo:** 1890-2 **Logging systems:** - RS- HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D58A **WAA Number:** 510 **NOI Unit:** 1000 **Original LSTA Unit:** 744-524

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 32.2 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** SE
Volume class breakdown: Class 4: 27.6 Class 5: 4.6 Class 6: 0.0 Class 7: 0.0 **Low Productive** 5.9
Visuals: Seen 38.1 Not Seen 0.0 **VQOs:** PR- 0.0 MM- 38.1 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** SPNM **High VAC** 0.0 **Intermediate VAC** 38.0 **Low VAC** 0.2 **Roadless** 38.1
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 5.3 Soils: 0.0
Mass movement Index: Low 17.4 Medium 20.7 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 10.6 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 17.4 3- 20.7 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 4.5 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 34.8
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
South-central part of unit (M-12) contains about 20 acres of forested wetlands, low-volume, mixed conifer plant series. Recommend partial log suspension (BMPs 12.5 and 13.9). V-notch and water quality stream runs through middle of unit (L-14 to N-12) and north unit boundary (N-17 to P-15). Recommend split yarding between settings 1 and 2 on this V-notch (BMP 13.9). NRB 8/9/95

Timber Input
Planned logging system design for this unit is Running Skyline. Confirm final road and landing locations. Verify feasibility of split yarding Class III streams within unit and adjust roads, landings, or modify unit boundary if required.

Engineering Input
Pink/Chum timing (June 1 - August 7) may apply for all road construction and/or drainage installations.

Fish/Watershed Input
Class III HC5 stream north: Split yarding and full suspension required (BMP13.9).
Class III HC6 stream south: Sideslope buffer required (BMP 12.6a).
Class III HC4 stream central: Split yarding and full suspension required (BMP13.9).
Class III HC4 stream east: Sideslope buffer required (BMP 12.6a).
Class III HC5 stream north: Sideslope buffer required (BMP12.6a).

Wildlife Input
Harvest operations restricted to April 1 to October 31 to protect trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit is visable from Carroll Inlet. Adopted VQO is modification. Beach and estuary buffers will help to screen unit.

Lands Input
No concerns. NRB 8/9/95

Cultural Resource Input
No concerns within unit. Road access into unit passes through high probability areas that have been surveyed. However, final road locations will need to be evaluated again during layout.

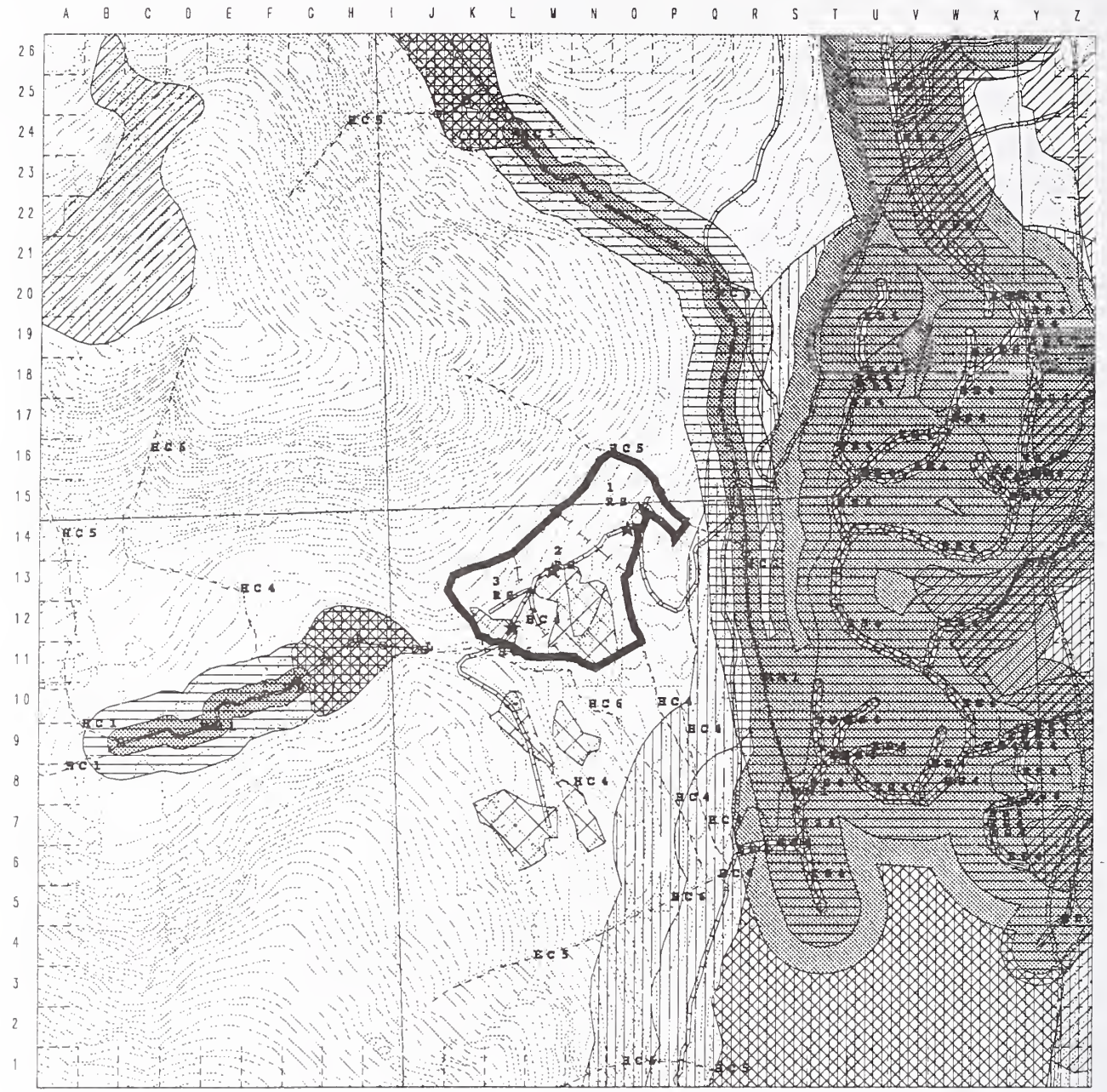
Geological Input
V-notch within harvest unit. See Soils Input. NRB 8/9/95

Silviculture Input
Plant 10 acres. Monitor regeneration in wetlands. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 1

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-98, /fs1files/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

- Class 1 Stream
- Class 2 Stream
- Class 3 Stream
- Section Line
- Planning Roads
- Unit Boundary
- Setting Line
- Contour or Ortho Line
- Beach or Estuary Buffer
- Private Land
- Implementation Buffer
- Anadromous 300 ft. Buffer
- Body of Water
- Prior Harvest
- Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Volc 4 - 28
Volc 5 - 5
Volc 6 - 0
Volc 7 - 0
Total Acres - 38
Potential MBF - 969
Quarter Quad - X1NC5NE
VCU Number - 744
Photo Number - 1890-2
Alternative Pattern - 20007
★ Landing

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 3 **Planned Acres:** 55.0 **Estimated Volume:** 2,482.0 **In Alternatives:** 0 , 3 , 5 , 0 , 0
Silvicultural System : See section **Number of Settings:** 6 **Quad:** KTNC4NW **Photo:** 1890-51 **Logging systems:** - HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D71A **WAA Number:** 510 **NOI Unit:** 1002 **Original LSTA Unit:** 744-342

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 0.0 Spruce 0.0 Mixed Hem/Spr 55.0 **Nonforested** 0.0 **Aspect:** NE
Volume class breakdown: Class 4: 0.0 Class 5: 0.0 Class 6: 55.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 38.1 Not Seen 16.9 **VQOs:** PR- 0.0 MM- 16.9 M- 38.1 P- 0.0 R- 0.0
Recreation: Primary ROS Code SPNM **High VAC** 0.0 **Intermediate VAC** 40.6 **Low VAC** 0.0 **Roadless** 55.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 0.0 Medium 12.1 High 42.9 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.2 **Site Productivity Classes** 1- 0.2 2- 0.0 3- 0.0 4- 54.8
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 40.8
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Much of this unit is made up of high landslide potential soils, MMI=3 (BMP 13.5). Recommend at least partial log suspension when yarding (BMP 13.9). The lower road (K-14 to O-13) will require some full-bench construction across steep slopes (BMP 14.7). NRB 8/29/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Northwestern corner of planned unit appears to be a blindlead. Verify and convert to Helicopter yarding or defer entry at this time.

Engineering Input
High MMI soils. Road construction must minimize landslide potential (BMP 14.7)
Oversteepened slopes may require full bench construction and endhaul of waste (BMP 14.7)

Fish/Watershed Input
Class II MM1 stream northeast: 120 foot no cut buffer required (BMP12.6, 12.6a).

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
Portion of unit may be visable from where Carroll Creek enters Carroll Inlet. Adopted VQO is modification.
The beach/estuary buffer in conjunction with the uncut block of timber located along western edge of the unit will offer substantial screening. WEA 9/30/95

Lands Input
No concerns. NRB 8/29/95

Cultural Resource Input
No concerns. RL 9/30/95

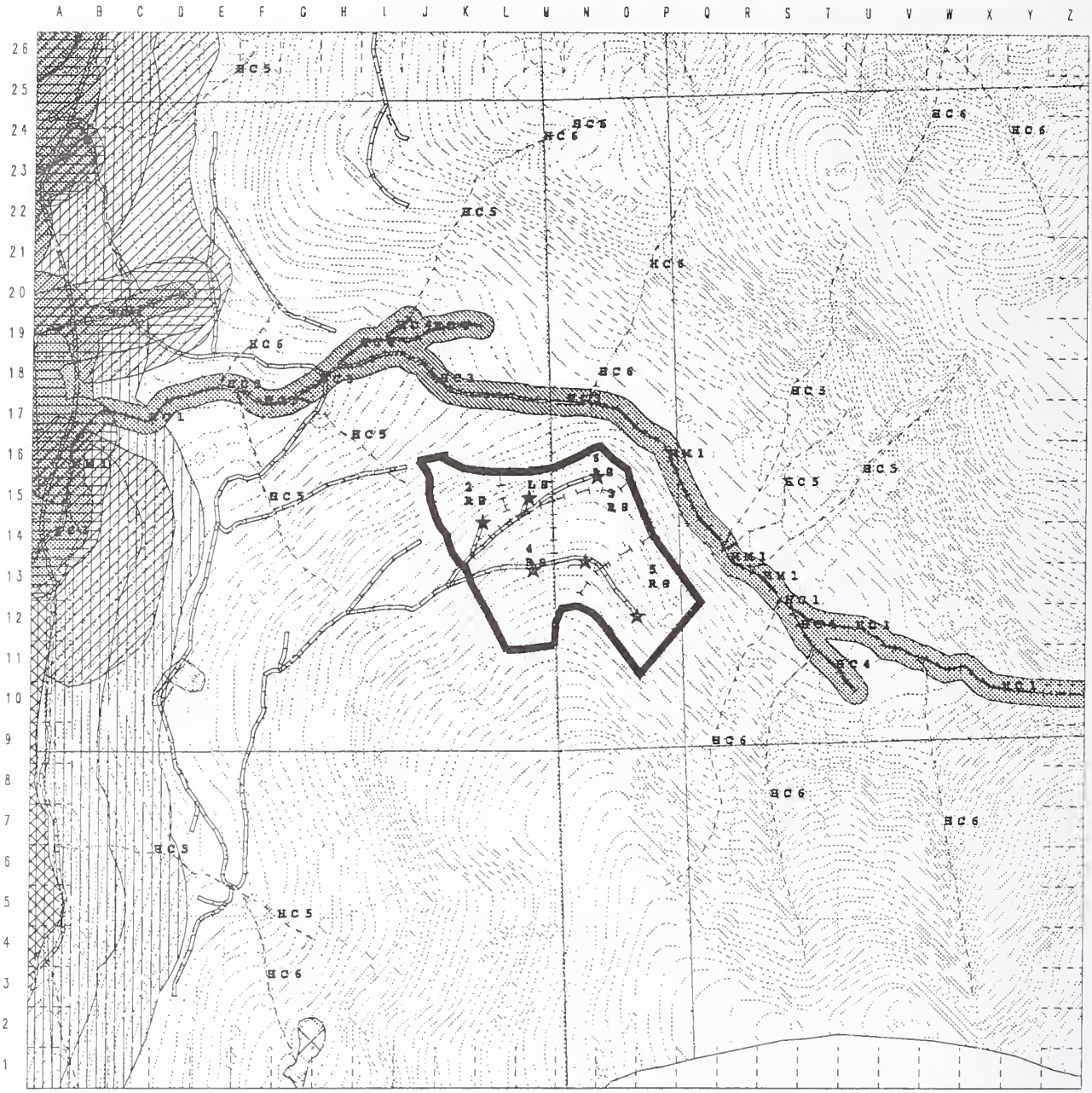
Geological Input
Unit is adjacent to a V-notch/avalanche tract (O-11 to Q-13). Recommend that an avalanche firm buffer of mature trees be left along the eastern unit boundary to protect regeneration. NRB 8/29/95

Silviculture Input
Moderate productivity, with small areas of high elevation and high mass movement soils. Planting will be required, using Alaska yellow cedar if available. (3 acres) CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 3

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fstiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vol 4 - 0
Vol 5 - 0
Vol 6 - 55
Vol 7 - 0
Total Acres - 55
Potential MBF - 2482
Quarter Quad - KTNC4NW
VCU Number - 744
Photo Number - 1890-51
Alternative Pattern - 3050
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet
0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 4 **Planned Acres:** 35.4 **Estimated Volume:** 1,182.0 **In Alternatives:** 0 , 0 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 3 **Quad:** KTNC5NE **Photo:** 1890-6 **Logging systems:** - RS- HE- SL
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 1003 **Original LSTA Unit:** 744-499

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 31.7 Spruce 0.0 Mixed Hem/Spr 2.5 **Nonforested** 0.0 **Aspect:** SW
Volume class breakdown: Class 4: 4.8 Class 5: 26.9 Class 6: 2.5 Class 7: 0.0 **Low Productive** 1.3
Visuals: Seen 8.6 Not Seen 26.8 **VQOs:** PR- 0.0 MM- 26.8 M- 0.0 P- 0.0 R- 0.0
Recreation: Primary ROS Code P **High VAC** 35.4 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 35.4
Riparian MA: Class 1 Stream: 0.2 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 2.1 Medium 28.5 High 4.7 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 4.9 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 2.1 3- 33.2 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 3.8 Marten- 27.7 River Otter- 3.8 Bald Eagle- 3.8 Black Bear- 35.1
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
The south end of this harvest unit is made up of forested wetlands, with some small open muskegs (BMP 12.5). Areas along the planned road are suitable for shovel yarding (BMP 13.9). Recommend at least partial log suspension when yarding the rest of these wetlands (BMP 13.9). Road construction should avoid areas of open muskeg (BMP 14.2). The north central part of the unit contains a small area, about 5 acres, of high landslide potential soils, MMI=3 (BMP 13.5). Recommend at least partial log suspension when this setting is yarded (BMP 13.9). Road construction should avoid these steep slopes (BMP 14.7). NRB 8/29/95

Timber Input
Planned logging systems design for this unit is Running Skyline, Shovel, and Slackline Yarding. A profile/logging systems analysis will establish unit boundary on the eastern portion of the Slackline setting where a slope break was identified. Confirm final road and landing locations.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7)
Steelhead/Coho/Pink/Chum timing (July 18 - August 7) may apply for all road construction and/or drainage installations.

Fish/Watershed Input
Class I FP5 stream south (TTRA): 300 foot buffer (BMP 12.6a).
Class I LC2 stream east (TTRA): 200 foot buffer (BMP 12.6a).
Class I FP4 stream southeast (TTRA): 260 foot buffer (BMP 12.6a).
Class II HC2 streams southwest (TTRA): 120 foot buffer (BMP 12.6a).
Class II MM2 stream southwest (TTRA): 120 foot buffer (BMP 12.6a).
Class II MM2 (Main channel) stream northwest (TTRA): 200 foot buffer (BMP 12.6a).

Wildlife Input
Possible goshawk nest located near unit. Apply current standards and guidelines if nest is confirmed.

Recreation / Visuals Input
No concerns. WEA 9/30/95

Lands Input
No concerns. NRB 8/29/95

Cultural Resource Input
No concerns. RL 9/30/95

Geological Input
Unit is located next to a major floodplain. Unit layout and road location should avoid this floodplain if possible (BMP 12.4). If roads must cross the floodplain, select the narrowest, most stable crossing available and provide adequate cross-drains for any overflow, backwater channels (BMP 14.2). NRB 8/29/95

Silviculture Input
Moderate productivity, with small areas of Hydric soils that will need to be planted. (10 acres) CBG 10/16/95 Prescription should address partial cut stream buffer.

Upper Carroll Study Area Unit Schematic - Final Unit 4

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vols 4 - 5
Vols 5 - 27
Vols 6 - 2
Vols 7 - 0
Total Acres - 35
Potential MBF - 1182
Quarter Quad - K1NC5NE
VCU Number - 744
Photo Number - 1890-6
Alternative Pattern - 560
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet
0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 5 **Planned Acres:** 35.9 **Estimated Volume:** 960.7 **In Alternatives:** 2 , 0 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 2 **Quad:** KTNC5NE Photo: 1890-6 **Logging systems:** - HE- LS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 1004 **Original LSTA Unit:** 744-498

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 29.3 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** SE
Volume class breakdown: Class 4: 15.4 Class 5: 13.8 Class 6: 0.0 Class 7: 0.0 **Low Productive** 6.7
Visuals: Seen 31.6 Not Seen 4.3 **VQOs:** PR- 0.0 MM- 4.3 M- 0.0 P- 0.0 R- 0.0
Recreation: Primary ROS Code P **High VAC** 35.9 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 35.9
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.8 Soils: 0.0
Mass movement Index: Low 22.2 Medium 13.2 High 0.5 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 1.6 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 22.7 3- 13.3 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 12.1 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 31.1
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
The north central part of the unit (M,N-15) contains an area of high landslide potential, MMI=3 (BMP 13.5). The north (K-16, L-15) parts and the south end of the unit (N-9) includes some forested wetlands (BMP 12.5). Recommend at least partial log suspension when yarding these areas (BMP 13.9). NRB 8/30/95

Timber Input
Planned logging systems design for this unit is Running Skyline and Live Skyline. Confirm final road and landing locations.

Engineering Input
High MMI soils in some areas. Road construction must minimize landslide potential. (BMP 14.7) Steelhead/Coho/Pink/Chum timing (July 18 - August 7) may apply for all road construction and/or drainage installations.

Fish/Watershed Input
Class I MC3 stream east (TTRA): 100 foot buffer (BMP 12.6,12.6a).
Class III HC5 stream northwest: Sideslope buffer (BMP 12.6,12.6a).
Class III HC2 and HC3 streams central: split yarding or full suspension required (BMP13.16)

Wildlife Input
Possible goshawk nest in or near unit. Apply current standards and guidelines if nest is confirmed.. Snag distribution concerns were addressed between the Draft and Final EIS by deleting a portion of the unit.

Recreation / Visuals Input
No concerns. WEA 9/30/95

Lands Input
No concerns. NRB 8/30/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

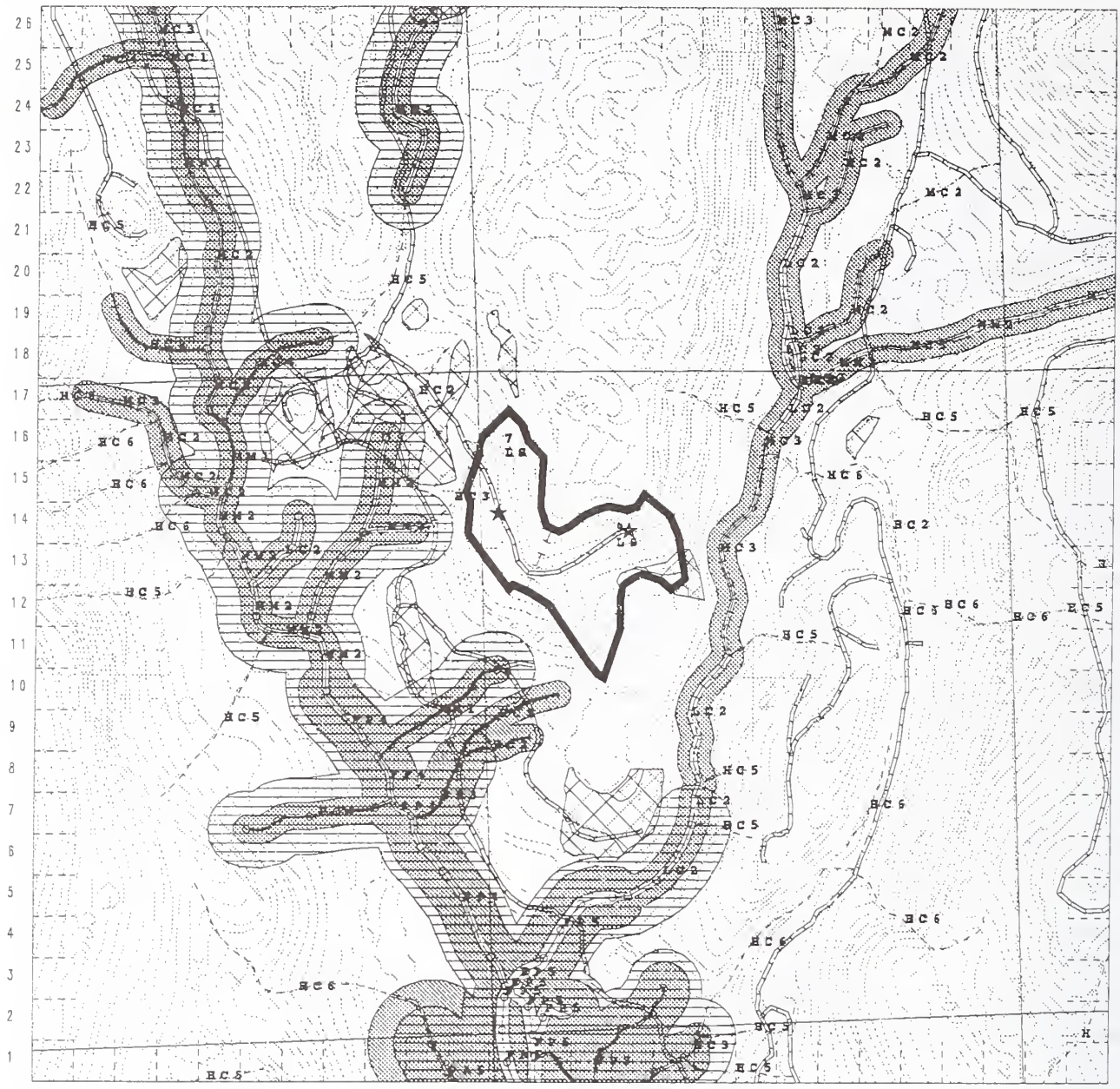
Geological Input
No concerns. NRB 8/30/95

Silviculture Input
Moderate productivity, with small areas of Hydric soils that will need to be planted. (15 acres) CBG 10/16/95
Prescription should address partial cut stream buffer.

Upper Carroll Study Area Unit Schematic - Final Unit 5

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 333 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Volc 4 - 15
Volc 5 - 14
Volc 6 - 0
Volc 7 - 0
Total Acres - 36
Potential MBF - 961
Quarter Quad - KTNC5NE
VCU Number - 744
Photo Number - 1890-6
Alternative Pattern - 200560

★ Landing

Feet

0 525 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 6 **Planned Acres:** 23.2 **Estimated Volume:** 558.5 **In Alternatives:** 2 , 0 , 5 , 0 , 0
Silvicultural System : See section **Number of Settings:** 2 **Quad:** KTNC5NE **Photo:** 1890-7 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 1005 **Original LSTA Unit:** 744-480

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 18.9 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** SW
Volume class breakdown: Class 4: 18.7 Class 5: 0.2 Class 6: 0.0 Class 7: 0.0 **Low Productive** 4.3
Visuals: Seen 19.7 Not Seen 3.4 **VQOs:** PR- 0.0 MM- 3.4 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 23.2 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 23.2
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 1.6 Soils: 0.0
Mass movement Index: Low 10.0 Medium 9.9 High 3.3 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 12.1 3- 11.0 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.6 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 19.5
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
High landslide potential soils are in the north (N-15) and east (O-13) parts of the unit (BMP 13.9). Much of the rest of the unit consists of low volume stands on forested wetlands, and small muskeg openings (BMP 12.5).Recommend at least partial log suspension when yarded (BMP 13.9). Recommend that road location avoids open muskegs (BMP 14.2). NRB
8/31/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Access road into unit should be located as far uphill as possible to take advantage of flats between slope breaks.

Engineering Input
HIgh MMI soils. Road consctuction must minimize landslide potential. (BMP 14.7) Road should avoid open muskegs where possible. (BMP 14.2)

Fish/Watershed Input
Class III HC2 central: split yarding or full suspension required. (BMP 13.16)
Class III HC2 west: foot sideslope buffer (BMP 12.6, 13.16).

Wildlife Input
Possible goshawk nest located in or near unit. Apply current standards and guidelines if nest is confirmed.

Recreation / Visuals Input
No concerns. WEA 9/30/95

Lands Input
No concerns. NRB 8/31/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

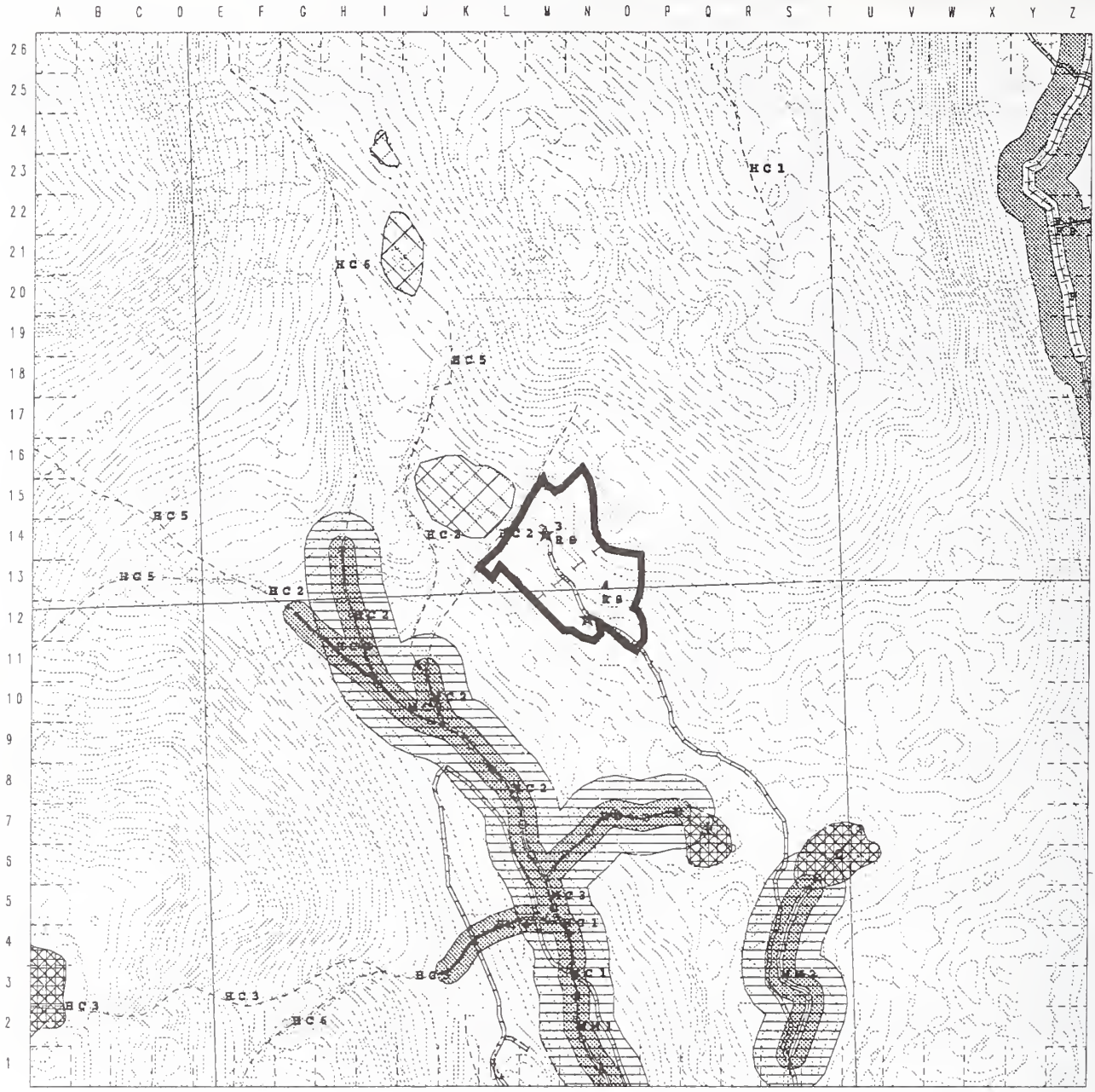
Geological Input
No concerns. NRB 8/31/95

Silviculture Input
Moderately productive, with small areas of Hydric soils that will need to be planted (8 acres). Monitor regeneration on hydric soils. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 6

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fstiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

- Class 1 Stream
- Class 2 Stream
- Class 3 Stream
- Section Line
- Planning Roads
- Unit Boundary
- Setting Line
- Contour or Ortho Line
- Beach or Estuary Buffer
- Private Land
- Implementation Buffer
- Anadromous 300 ft. Buffer
- Body of Water
- Prior Harvest
- Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Volc 4 - 19
Volc 5 - 0
Volc 6 - 0
Volc 7 - 0
Total Acres - 23
Potential MBF - 559
Quarter Quad - K1NC5NE
VCU Number - 744
Photo Number - 1890-7
Alternative Pattern - 20050

★ Landing

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 7 **Planned Acres:** 36.4 **Estimated Volume:** 1,178.5 **In Alternatives:** 2 , 0 , 5 , 0 , 0
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC5NE **Photo:** 1890-8 **Logging systems:** - HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 1006 **Original LSTA Unit:** 744-479

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 35.1 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** SW
Volume class breakdown: Class 4: 6.5 Class 5: 28.6 Class 6: 0.0 Class 7: 0.0 **Low Productive** 1.2
Visuals: Seen 33.0 Not Seen 3.4 **VQOs:** PR- 0.0 MM- 3.4 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 36.4 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 36.4
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 2.7 Soils: 0.0
Mass movement Index: Low 0.0 Medium 12.8 High 23.6 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 1.0
Wetland Information: Wetland 10.4 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.1 3- 36.3 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 24.4
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit made up of high landslide potential, MMI=3, soils, bordering on very high, MMI=4 (BMP 13.5). Recommend full log suspension when yarding this unit (BMP 13.9). Low-productivity, sub-alpine, mountain hemlock and mixed conifer series site. Includes some forested wetlands (BMP 12.5). Potential for snow damage to regeneration and slow growth in severe climate. NRB 8/31/95

Timber Input
Planned logging systems design for this unit is Helicopter.

Engineering Input
HIgh MMI soils. Road construction mus tminimize landslide potential. (BMP 14.7)

Fish/Watershed Input
Class III HC6 stream west: sideslope buffer required (BMP12.6a).
Class III HC5 stream south : split yard and full suspension required (BMP13.9).

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns. WEA 9/30/95

Lands Input
No concerns. NRB 8/31/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

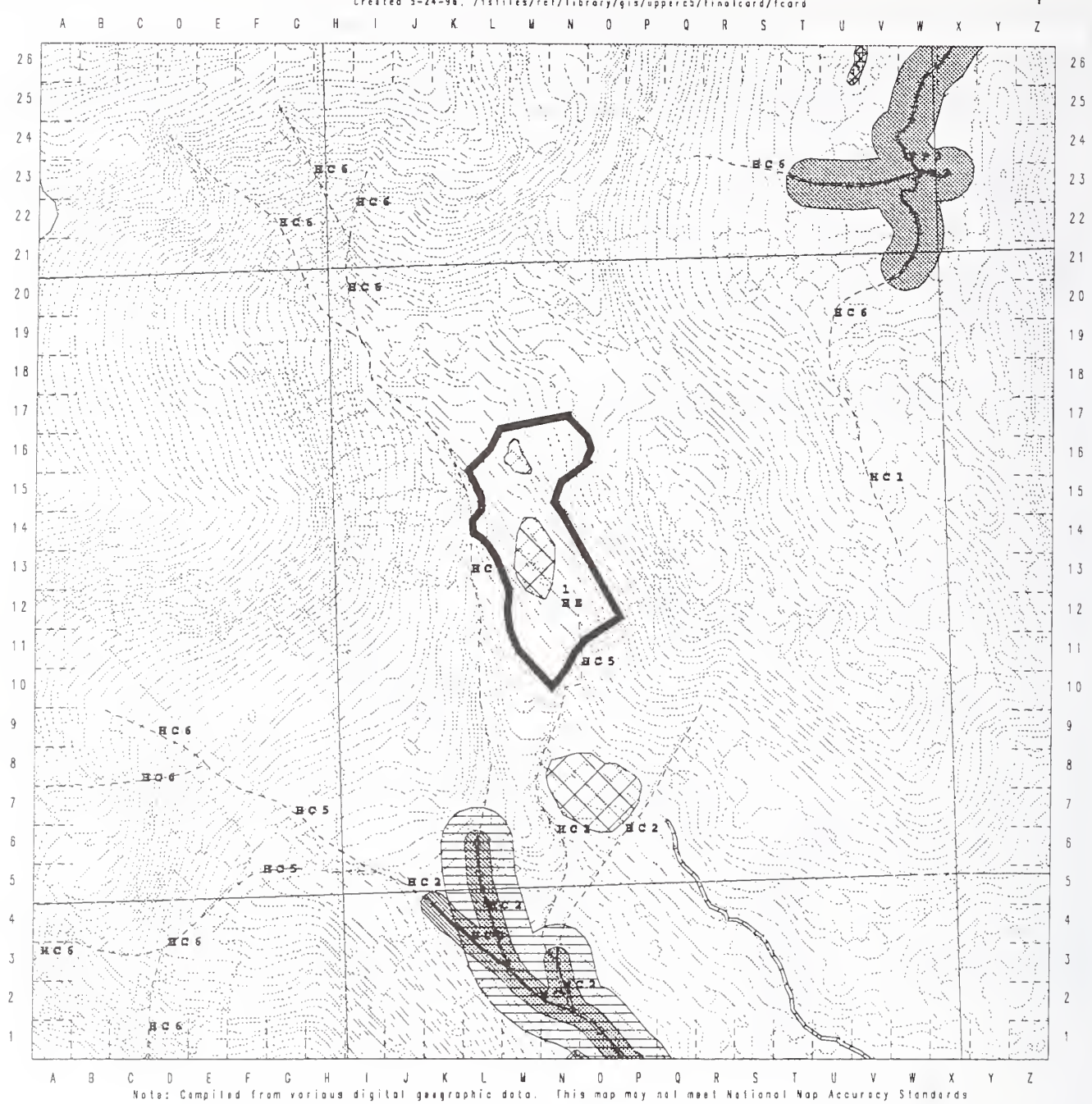
Geological Input
No concerns. NRB 8/31/95

Silviculture Input
Moderately productive with small areas of high elevation and high mass movement soils. Apply shelterwood harvest system leaving all trees 13" DBH and under standing. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 7

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96. /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vole 4 - 7
Vole 5 - 29
Vole 6 - 0
Vole 7 - 0
Total Acres - 36
Potential MBF - 1179
Quarter Quad - KINGSME
VCU Number - 744
Photo Number - 1890-8
Alternative Pattern - 20050
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet
0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 8 **Planned Acres:** 91.9 **Estimated Volume:** 3,172.9 **In Alternatives:** 2 , 3 , 5 , 6 , 7
Silvicultural System : See section **Number of Settings:** 10 **Quad:** KTNC5NE **Photo:** 1890-4 **Logging systems:** - RS- HE- SH
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 1007 **Original LSTA Unit:** 744-381

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 59.5 Spruce 0.0 Mixed Hem/Spr 32.3 **Nonforested** 0.0 **Aspect:** W
Volume class breakdown: Class 4: 0.0 Class 5: 91.9 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 72.1 Not Seen 19.8 **VQOs:** PR- 0.0 MM- 19.8 M- 25.9 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** SPNM **High VAC** 22.0 **Intermediate VAC** 69.8 **Low VAC** 0.0 **Roadless** 84.1
Riparian MA: Class 1 Stream: 0.3 Class 2 Stream: 0.0 Class 3 Stream: 11.9 Soils: 1.3
Mass movement Index: Low 56.0 Medium 12.8 High 23.1 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 12.8 Mix Wetland 0.0 Riparian Soil 0.3 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 12.8 4- 79.1
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 80.3 River Otter- 6.1 Bald Eagle- 0.3 Black Bear- 86.8
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
The south part of this unit contains forested wetlands (BMP 12.5). Recommend at least partial log suspension be achieved in yarding (BMP 13.9) to minimize wetland disturbance. Recommend overlay road construction with adequate cross drains where feasible on these wetlands (BMPs 14.2, 14.3) NRB 9/18/95

Timber Input
Planned logging systems design for this unit is Running Skyline, Shovel, Live Skyline, and Helicopter.. Confirm final road and landing locations.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. Oversteepened slopes may require full bench construction and endhaul of waste. (BMP 14.7) Steelhead/Coho/Pink/Chum timing (July 18 - August 7) may apply for all road construction and/or drainage installations.

Fish/Watershed Input
Class I FP5 stream southwest (TTRA): 300 foot buffer (BMP 12.6,12.6a)
Class III HC5 streams northwest: split yarding or full suspension required (BMP13.16,13.9)
Class III HC6 stream southeast: sideslope buffer required (BMP 12.6).

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
Portion of unit is visable from Carroll Inlet. Identified visual quality objective is modification. Adjacent uncut standing timber will help to screen this unit. WEA 9/30/95

Lands Input
No concerns. NRB 9/18/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

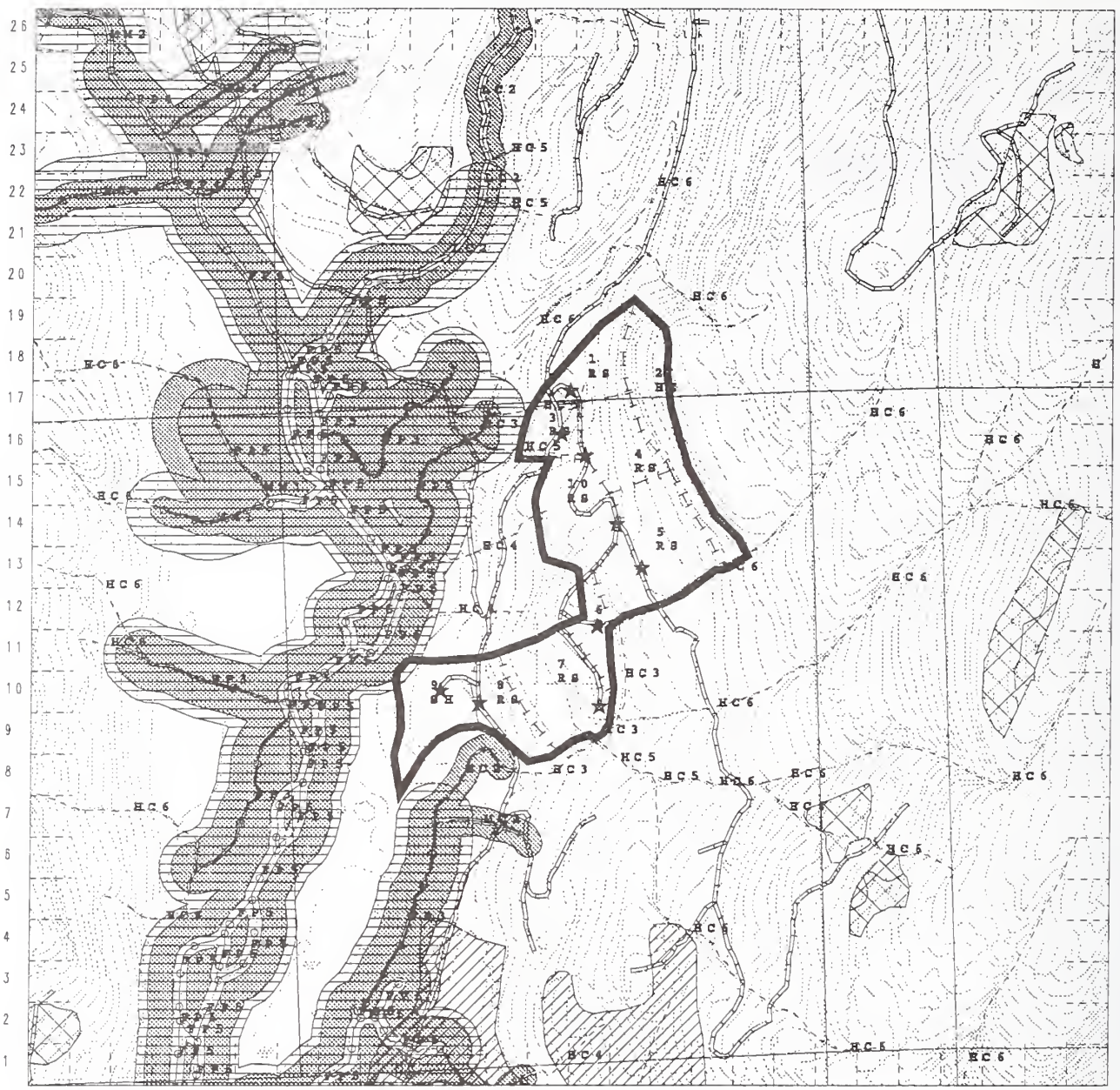
Geological Input
No concerns. NRB 9/18/95

Silviculture Input
This unit has moderate volume, with small areas of Hydric soils that will need to be planted. (13 acres) Monitor regeneration on hydric soils. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 8

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Flooding Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 100 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vol 4 - 0
Vol 5 - 92
Vol 6 - 0
Vol 7 - 0
Total Acres - 92
Potential MBF - 3173
Quarter Quad - KTNC5NE
VCU Number - 744
Photo Number - 1890-4
Alternative Pattern - 230567

★ Landing

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 9 **Planned Acres:** 36.3 **Estimated Volume:** 1,100.2 **In Alternatives:** 2 , 3 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 5 **Quad:** KTNC4NW **Photo:** 1890-47 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 1008 **Original LSTA Unit:** 744-389

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 36.3 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** N
Volume class breakdown: Class 4: 21.6 Class 5: 14.6 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 0.0 Not Seen 36.3 **VQOs:** PR- 0.0 MM- 36.3 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 36.3 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 36.3
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 3.8 Soils: 0.0
Mass movement Index: Low 0.0 Medium 9.4 High 26.9 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.1
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 31.2 4- 5.1
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 10.6 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 35.6
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Lower part of the unit consists of high landslide potential soils, MMI=3 (BMP 13.5). Upper part of unit is mainly forested wetlands (BMP 12.5). Recommend at least partial log suspension be achieved when yarding these areas (BMP 13.9). Road locations should avoid wetlands, if possible (BMP 14.3). Road construction on high landslide potential soils may require full bench design (BMP 14.7). NRB 9/21/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Field reconnaissance shows that the south 1/2 of the unit is unfeasible for roading and harvest. Recommend reducing unit boundary to first major slope break @ H12 to R13. Confirm final road and landing locations.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. Oversteepened slopes may require full bench construction and endhaul of waste. (BMP 14.7)

Fish/Watershed Input
Class II MM1/MM2 north (TTRA): 120 foot buffer (BMP 12.6, 12.6a)
Class III AF2 east: 140 foot buffer (BMP12.6, 12.6a)
Class III HC5 west: sideslope buffer required (BMP 12.6, 12.6a)
Class III HC5 northcentral: split yarding and full suspension required (BMP 13.16).

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/28/95

Lands Input
No concerns. NRB 9/21/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

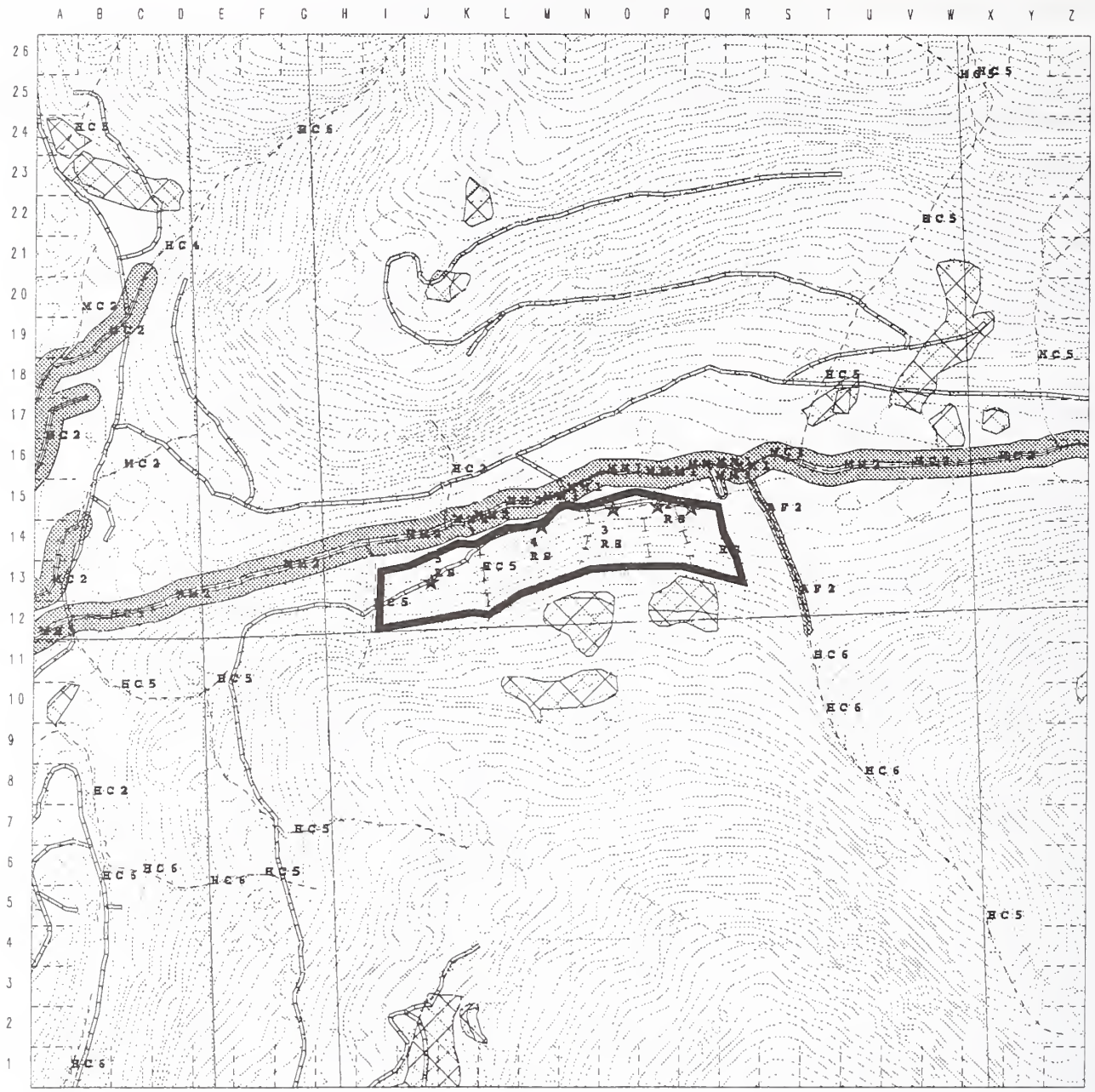
Geological Input
No concerns. NRB 9/21/95

Silviculture Input
Moderately productive with small areas of Hydric soils as well as areas of high mass movement potential. Planting will be needed on 23 acres. Prescription should address partial cut stream buffer. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 9

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /tstiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vole 4 - 22
Vole 5 - 15
Vole 6 - 0
Vole 7 - 0
Total Acres - 36
Potential MBF - 1100
Quarter Quad - KINC4NW
VCU Number - 744
Photo Number - 1890-47
Alternative Pattern - 230560

★ Landing

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 11 **Planned Acres:** 28.2 **Estimated Volume:** 992.2 **In Alternatives:** 2 , 0 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 5 **Quad:** KTNC5NE **Photo:** 1890-6 **Logging systems:** - RS- HE- LS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 1010 **Original LSTA Unit:** 744-489

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 23.7 Spruce 0.0 Mixed Hem/Spr 4.6 **Nonforested** 0.0 **Aspect:** E
Volume class breakdown: Class 4: 4.4 Class 5: 19.2 Class 6: 4.6 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 0.0 Not Seen 28.2 **VQOs:** PR- 0.0 MM- 28.2 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 28.2 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 28.2
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.2 Class 3 Stream: 1.9 Soils: 0.0
Mass movement Index: Low 0.0 Medium 28.2 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 3.9 Mix Wetland 12.2 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 28.2 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 21.3 River Otter- 5.2 Bald Eagle- 0.0 Black Bear- 16.1
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
South part of unit (M,N-11), about 8 acres, is mixture of forested wetlands and muskeg (BMP12.5). This part of the unit is suitable for shovel logging (BMP 13.9). Entire unit has low to medium landslide potential, MMI=1 or 2. No mitigation measures required for logging or road construction. South end of unit is located near along riparian/floodplain area (L-11 to N-10). Unit layout should not include these alluvial soils (BMPs 12.4 and 12.6). NRB 8/10/95

Timber Input
Planned logging systems design for this unit is Running Skyline and Live Skyline. Confirm final road and landing locations. Road should be located close to south knob as possible.

Engineering Input
Steelhead/Coho/Pink/Chum timing (July 18 - August 7) may apply for all road construction and/or drainage installations.

Fish/Watershed Input
Class I MM1/MC1 stream east (TTRA): 120 foot no cut buffer (BMP12.6,12.6a).
Class II HC2 stream south (TTRA): 100 foot no cut buffer (BMP 12.6, 12.6a).
Class II HC4 stream north (TTRA): 100 foot no cut buffer (BMP 12.6,12.6a).

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 8/10/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

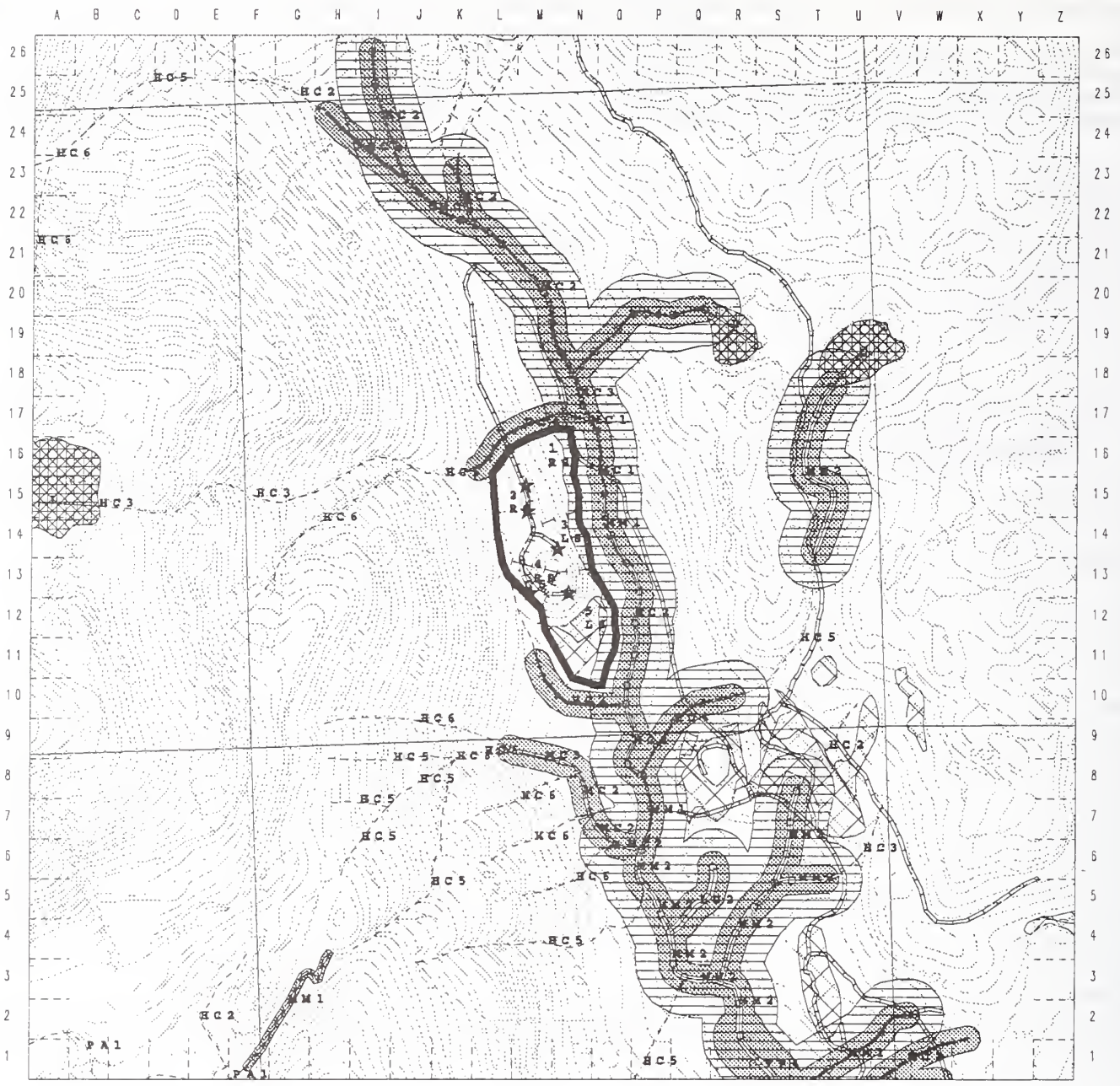
Geological Input
No concerns. NRB 8/10/95

Silviculture Input
High productivity with small areas of Hydric soils as well as areas of high mass movement potential. Plant 6 acres. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 11

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /istiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vols 4 - 4
Vols 5 - 19
Vols 6 - 5
Vols 7 - 0
Total Acres - 28
Potential MBF - 992
Quarter Quad - KINC5NE
VCU Number - 744
Photo Number - 1890-6
Alternative Pattern - 200560

★ Landing

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 12 **Planned Acres:** 34.9 **Estimated Volume:** 1,235.4 **In Alternatives:** 2 , 0 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC5NE **Photo:** 1890-6 **Logging systems:** - HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 1011 **Original LSTA Unit:** 744-489

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 32.2 Spruce 0.0 Mixed Hem/Spr 2.7 **Nonforested** 0.0 **Aspect:** E
Volume class breakdown: Class 4: 0.0 Class 5: 32.2 Class 6: 2.7 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 0.0 Not Seen 34.9 **VQOs:** PR- 0.0 MM- 34.9 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 34.9 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 34.9
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 0.0 Medium 6.6 High 27.9 Very High 0.4 Unknown 0.0 **Slopes Greater Than 72%** 13.2
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 34.9 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 6.4 River Otter- 4.1 Bald Eagle- 0.0 Black Bear- 30.9

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit is made up mostly of high landslide potential soils, MMI=3. Recommend at least partial log suspension be achieved on these soils (BMP 13.9). Slopes above the unit (K-16 to K-10) are MMI=4. Recommend that backline extend only to the 1100 foot elevation (BMP 13.5). Lower footslopes (M-16 to M-11) are classified as MMI=2 and require no special mitigation measures. NRB 8/10/95.

Timber Input
Planned logging systems design for this unit is Helicopter.

Engineering Input
High mass movement index soils. Road construction must minimize landslide potential (BMP 14.7)

Fish/Watershed Input
Class I MC1 stream east(TTRA): 100 foot no cut buffer (BMP12.6,12.6a).
Class III HC3 stream south: Sideslope buffer required (BMP12.6a).

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns. WEA 9/30/95

Lands Input
No concerns. NRB 8/10/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

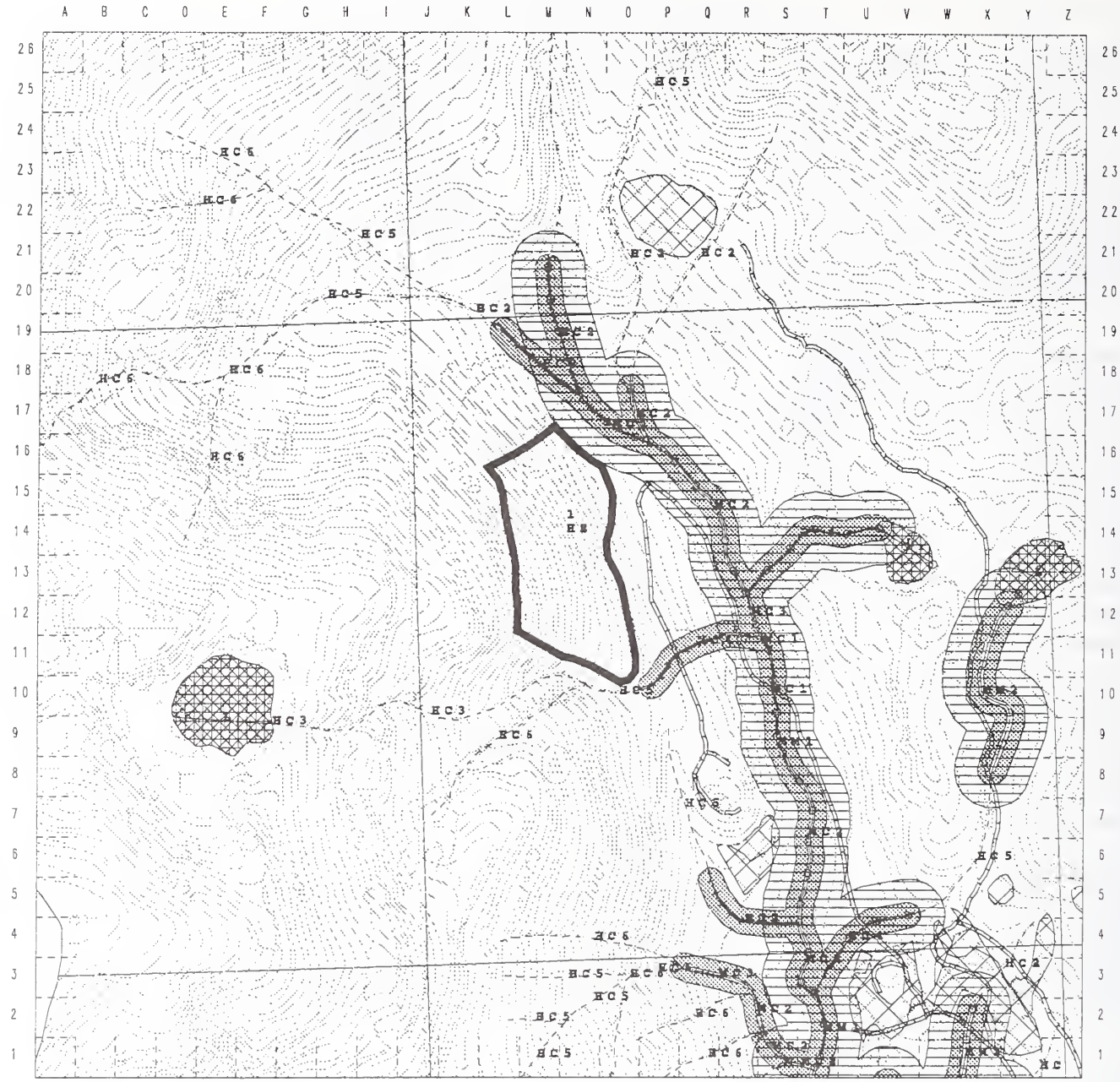
Geological Input
V-notch located along south unit boundary (K-10 to N-10). Provide windfirm buffer to protect the very steep and unstable sideslopes within the V-notch (BMP 12.6a, 13.5). NRB 8/10/95

Silviculture Input
High productivity, apply shelterwood harvest system leaving all trees 13" DBH and under standing. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 12

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fstiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data this map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 330 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Volc 4 - 0
Volc 5 - 32
Volc 6 - 3
Volc 7 - 0
Total Acres - 35
Potential MBF - 1235
Quarter Quad - KINGSME
VCU Number - 744
Photo Number - 1890-6
Alternative Pattern - 200580

★ Landing

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 13 **Planned Acres:** 37.2 **Estimated Volume:** 1,657.6 **In Alternatives:** 2 , 0 , 0 , 0 , 0
Silvicultural System : See section **Number of Settings:** 4 **Quad:** KTND5SW **Photo:** 1790-36 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 737 **Watershed Code:** BW8A **WAA Number:** 510 **NOI Unit:** 1012 **Original LSTA Unit:** 737-754

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 1.8 Spruce 0.0 Mixed Hem/Spr 35.4 **Nonforested** 0.0 **Aspect:** W
Volume class breakdown: Class 4: 0.0 Class 5: 1.8 Class 6: 35.4 Class 7: 0.0 **Low Productive** 0.1
Visuals: Seen 31.6 Not Seen 5.6 **VQOs:** PR- 28.5 MM- 5.6 M- 3.1 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 0.0 **Low VAC** 37.2 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 1.5 Medium 19.2 High 16.5 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.8
Wetland Information: Wetland 1.5 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.1 2- 1.4 3- 0.0 4- 35.7
High Value Habitat: Sitka Black-Tail Deer- 24.4 Marten- 24.4 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 36.1
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit is made up mostly of high landslide potential soils, MMI=3. Recommend at least partial log suspension be achieved on these soils (BMP 13.9). Slopes above the unit (K-16 to K-10) are MMI=4. Recommend that backline extend only to the 1100 foot elevation (BMP 13.5). Lower footslopes (M-16 to M-11) are classified as MMI=2 and require no special mitigation measures. NRB 8/10/95.

Timber Input
Planned logging systems design for this unit is Helicopter.

Engineering Input
High mass movement index soils. Road construction must minimize landslide potential (BMP 14.7)

Fish/Watershed Input
Several water quality streams are located in this unit (BMP 12.6a). SPL 1/3/95 Recommend that yarding be split on these streams and that full log suspension be maintained when yarding across the stream (BMP 13.9), trees be felled away from the stream-course and slash be removed within 48 hours (BMP 13.16). Variable width slope-break buffers may also be required (BMP 12.6a). NRB 9/18/95

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns. WEA 9/30/95

Lands Input
No concerns. NRB 8/10/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

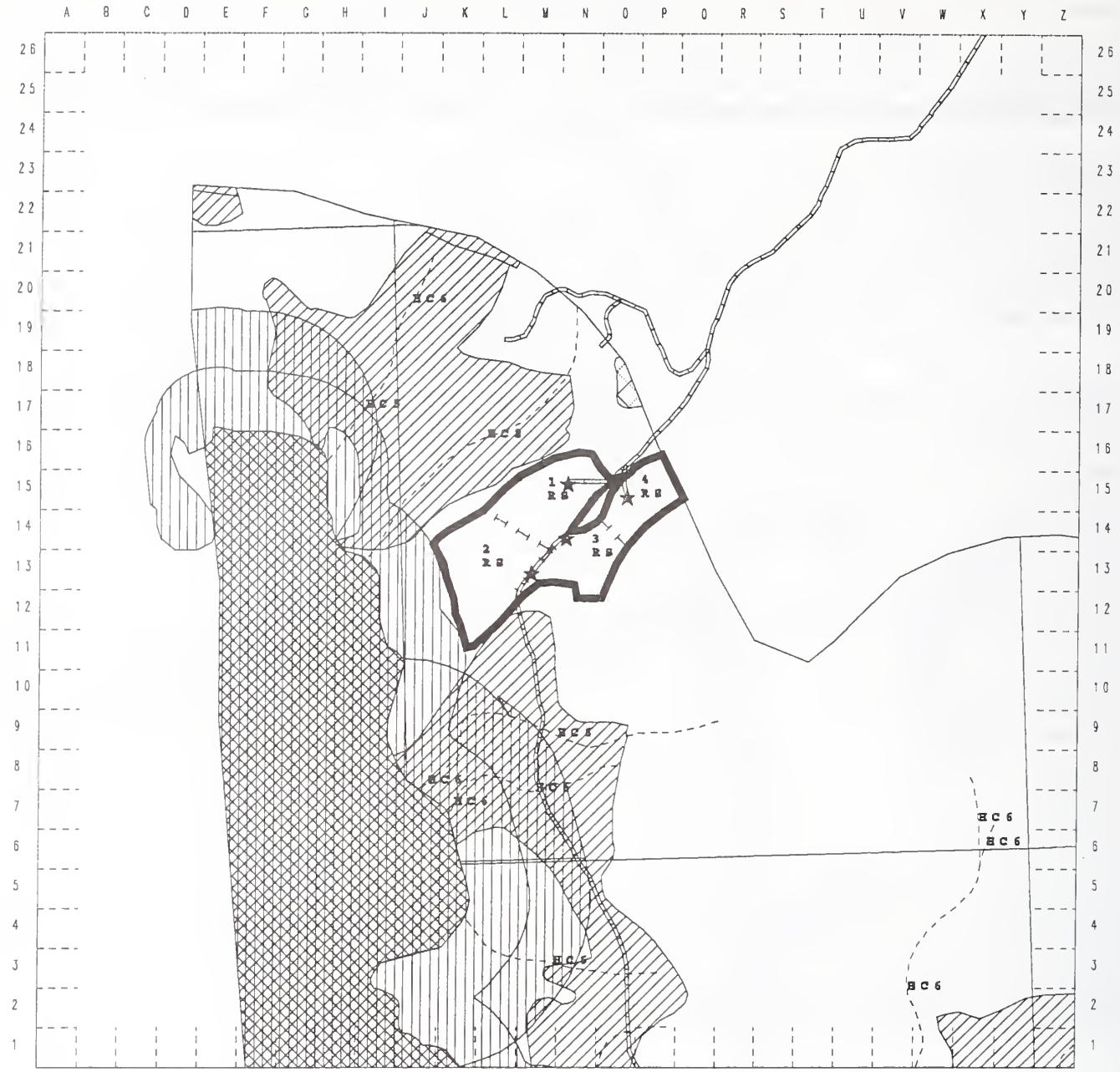
Geological Input
V-notch located along south unit boundary (K-10 to N-10). Provide windfirm buffer to protect the very steep and unstable sideslopes within the V-notch (BMP 12.6a, 13.5). NRB 8/10/95

Silviculture Input
High productivity, apply shelterwood harvest system leaving all trees 13" DBH and under standing. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 13

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vols 4 - 0
Vols 5 - 2
Vols 6 - 35
Vols 7 - 0
Total Acres - 37
Potential MBF - 1658
Quarter Quad - K1N055W
VCU Number - 737
Photo Number - 1790-36
Alternative Pattern - 20000

★ Landing

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 14 **Planned Acres:** 10.0 **Estimated Volume:** 346.4 **In Alternatives:** 2 , 0 , 5 , 0 , 0
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTND5SW **Photo:** 1790-35 **Logging systems:** - HE
Management Area: K32 **VCU Number:** 737 **Watershed Code:** BW11 **WAA Number:** 510 **NOI Unit:** 1013 **Original LSTA Unit:** 737-732

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 0.0 Spruce 0.0 Mixed Hem/Spr 10.0 **Nonforested** 0.0 **Aspect:** S
Volume class breakdown: Class 4: 0.0 Class 5: 10.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 10.0 Not Seen 0.0 **VQOs:** PR- 10.0 MM- 0.0 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 0.0 **Low VAC** 10.0 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.4 Soils: 0.0
Mass movement Index: Low 0.0 Medium 7.6 High 2.4 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 0.0 4- 10.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 8.9 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 10.0
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
V-notch along south-east unit boundary. See Geologic Input. NRB 8/24/95

Timber Input
Planned logging systems design for this unit is Helicopter. Landline location required - State land selection along south and west boundaries.

Engineering Input
There are no engineering mitigation measures anticipated for this unit.

Fish/Watershed Input
A water quality stream is located along the east unit boundary (BMP 12.6a). Variable width slope-break buffers may also be required (BMP 12.6a) NRB 8/24/95

Wildlife Input
Harvest operations restricted to April 1 to October 31 to protect trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit is visable from Neets Bay. Identified VQO is partial retention. Partial cutting will help modify visual impact. WEA 9/30/95

Lands Input
Unit is located uphill from SSRAA net pens in Neets Bay. SSRAA administrators should be advised when loggin takes place. NRB 8/24/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

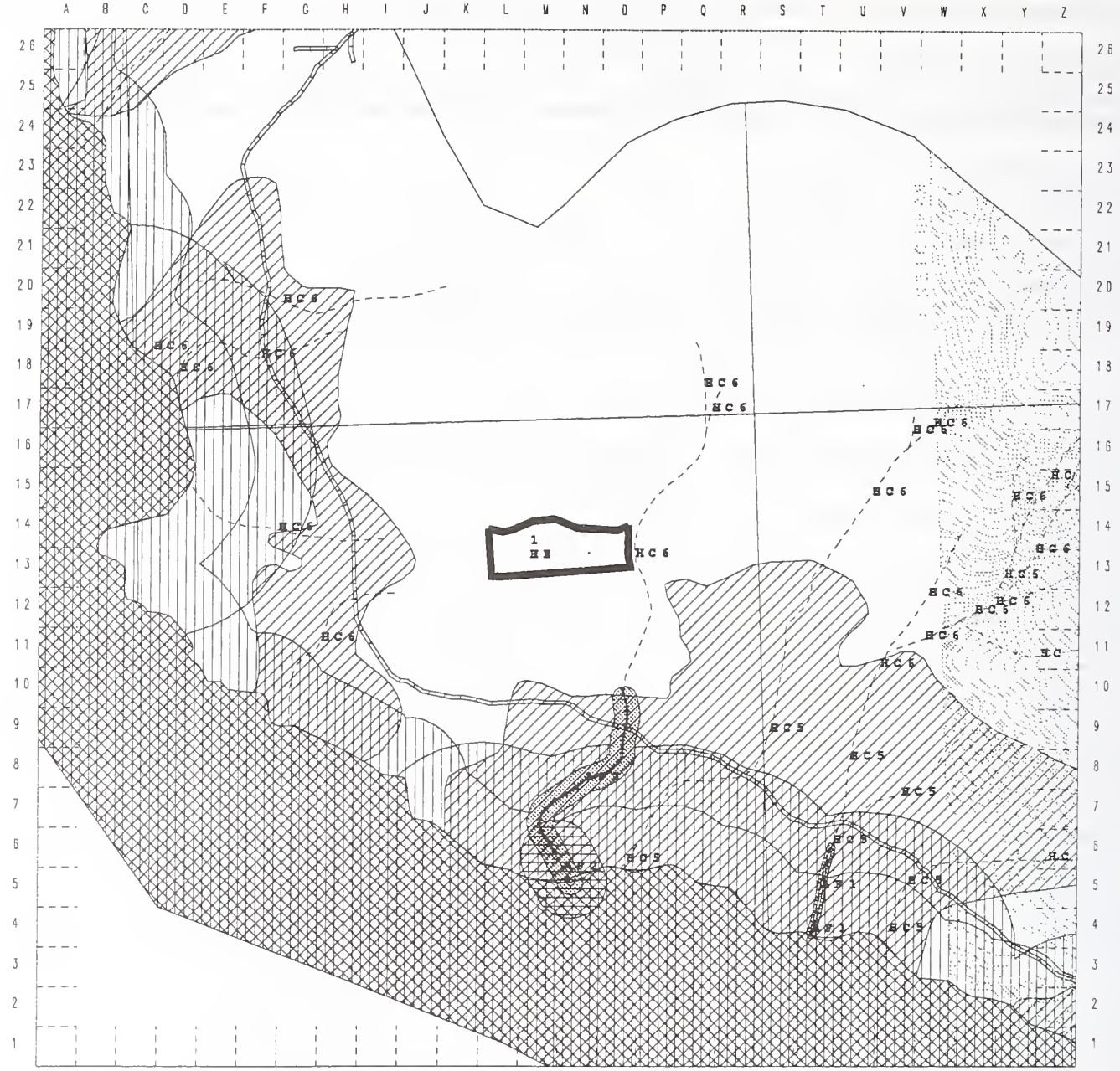
Geological Input
V-notch along south-east unit boundary (P-14 to P-12). Deep incision, steep unstable sideslopes. Recommend a wind-firm buffer be established along the west side of this V-notch (BMPs 12.6a, 13.5, 13.16). NRB 8/24/95

Silviculture Input
Moderate productivity with small areas of Hydric soils. Apply shelterwood harvest system leaving all trees 13" DBH and under standing. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 14

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /isfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vole 4 - 0
Vole 5 - 10
Vole 6 - 0
Vole 7 - 0
Total Acres - 10
Potential MBF - 346
Quarter Quad - 41N05SW
VCU Number - 737
Photo Number - 1790-35
Alternative Pattern - 20050

★ Landing

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 16 **Planned Acres:** 105.7 **Estimated Volume:** 2,829.0 **In Alternatives:** 2 , 3 , 5 , 0 , 0
Silvicultural System : See section **Number of Settings:** 10 **Quad:** KTNC4NW **Photo:** 1890-46 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 1015 **Original LSTA Unit:** 744-417

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 57.4 Spruce 0.0 Mixed Hem/Spr 32.1 **Nonforested** 0.0 **Aspect:** S
Volume class breakdown: Class 4: 57.4 Class 5: 32.1 Class 6: 0.0 Class 7: 0.0 **Low Productive** 16.2
Visuals: Seen 0.0 Not Seen 105.7 **VQOs:** PR- 0.0 MM- 105.7 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 105.7 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 105.7
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 12.7 Soils: 2.4
Mass movement Index: Low 6.1 Medium 90.8 High 8.8 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 11.7 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 6.1 3- 39.8 4- 59.7
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 18.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 86.5
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Upper slopes along the north edge of this unit (K-15 to M-15) include high landslide potential soils, MMI=3 (BMP 13.5). Recommend at least partial log suspension in yarding to minimize surface disturbance (BMP 13.9). Shallow soils on upper slopes are subject to windthrow. Recommend that partial cut silviculture systems not be used on these sites. Unit contains forested wetlands along footslope, southern unit boundary (H-12 to N-12) (BMP 12.5). Recommend at least partial suspension to protect wetland functions (BMP 13.9). NRB 8/24/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Field reconnaissance shows that northern most part of planned unit appears to be a blindlead past slope break if road location is not feasible.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7) Oversteepened slopes may require full bench construction and endhaul of waste. (BMP 14.7)

Fish/Watershed Input
Class III HC5 stream west: partial-cut buffer (BMP 12.6 & 12.6a)
Class III HC5 stream central: extended sideslope buffer (BMP 12.6 and 12.6a)
Class III HC6 stream east: split yarding or full suspension (BMP 13.9)
Class III AF2 stream east: 140 foot buffer (BMP 12.6 & 12.6a)
The biologist will work with the engineers to design the access road as far from the main channel as possible (BMPs 14.2, 14.3).

Wildlife Input
No blasting May 15 to June 15 to protect mountain goat kidding areas.

Recreation / Visuals Input
No concerns WEA 8/28/95

Lands Input
No concerns. NRB 8/24/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
No concerns. NRB 8/24/95

Silviculture Input
High productivity, monitor regeneration to determine if planting will be necessary. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 16

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /tsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 200 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vols 4 - 57
Vols 5 - 32
Vols 6 - 0
Vols 7 - 0
Total Acres - 106
Potential MBF - 2829
Quarter Quad - KING4NW
VCU Number - 744
Photo Number - 1890-46
Alternative Pattern - 23050

★ Landing

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 17 **Planned Acres:** 36.9 **Estimated Volume:** 1,162.0 **In Alternatives:** 2 , 0 , 5 , 0 , 0
Silvicultural System : See section **Number of Settings:** 2 **Quad:** KTND5SE **Photo:** 1790-63 **Logging systems:** - HE
Management Area: K32 **VCU Number:** 737 **Watershed Code:** C43A **WAA Number:** 510 **NOI Unit:** 1016 **Original LSTA Unit:** 737-639

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 36.4 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** S
Volume class breakdown: Class 4: 14.1 Class 5: 22.3 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.5
Visuals: Seen 36.9 Not Seen 0.0 **VQOs:** PR- 9.0 MM- 0.0 M- 27.9 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 27.9 **Low VAC** 9.0 **Roadless** 20.2
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 4.6 Soils: 0.0
Mass movement Index: Low 0.0 Medium 12.7 High 24.2 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 2.5
Wetland Information. Wetland 8.2 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 26.5 4- 10.5
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 2.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 34.4
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit contains soils with a high potetial for landslides (BMP 13.5). Unit also contains wetlands, some of it forested (BMP 12.5). Helicopter yarding prescribed for this unit will provide full log suspension and minimize the potential for surface disturbance (BMP 13.9). NRB 8/28/95

Timber Input
Planned logging systems design for this unit is Helicopter. Western most part of unit is adjacent to state land selection - land line survey required.

Engineering Input
There are no engineering mitigation measures anticipated for this unit.

Fish/Watershed Input
Two water quality streams are located in or adjacent to this unit (BMP 12.6a). SPL 1/3/95 Recommend that yarding be split on these streams and that full log suspension be maintained when yarding across the stream (BMP 13.9), trees be felled away from the stream-course and slash be removed with in 48 hours (BMP 13.16). A slope break (AHMU) buffer is recommended for the stream flowing along the boundary (BMP 12.6a). SPL 1/3/95

Wildlife Input
Harvest operations restricted to April 1 to October 31 to protect trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit is visable from Neets Bay. Identified VQO is modification. Partial cutting will mollify visual impacts. WEA 9/30/95

Lands Input
Unit is located above the SSRAA facilities at Neets Bay. SSRAA administrators should be advised when helicopter logging takes places overhead. NRB 8/28/95

Cultural Resource Input
No cultural resources identified. RL 9.30/95

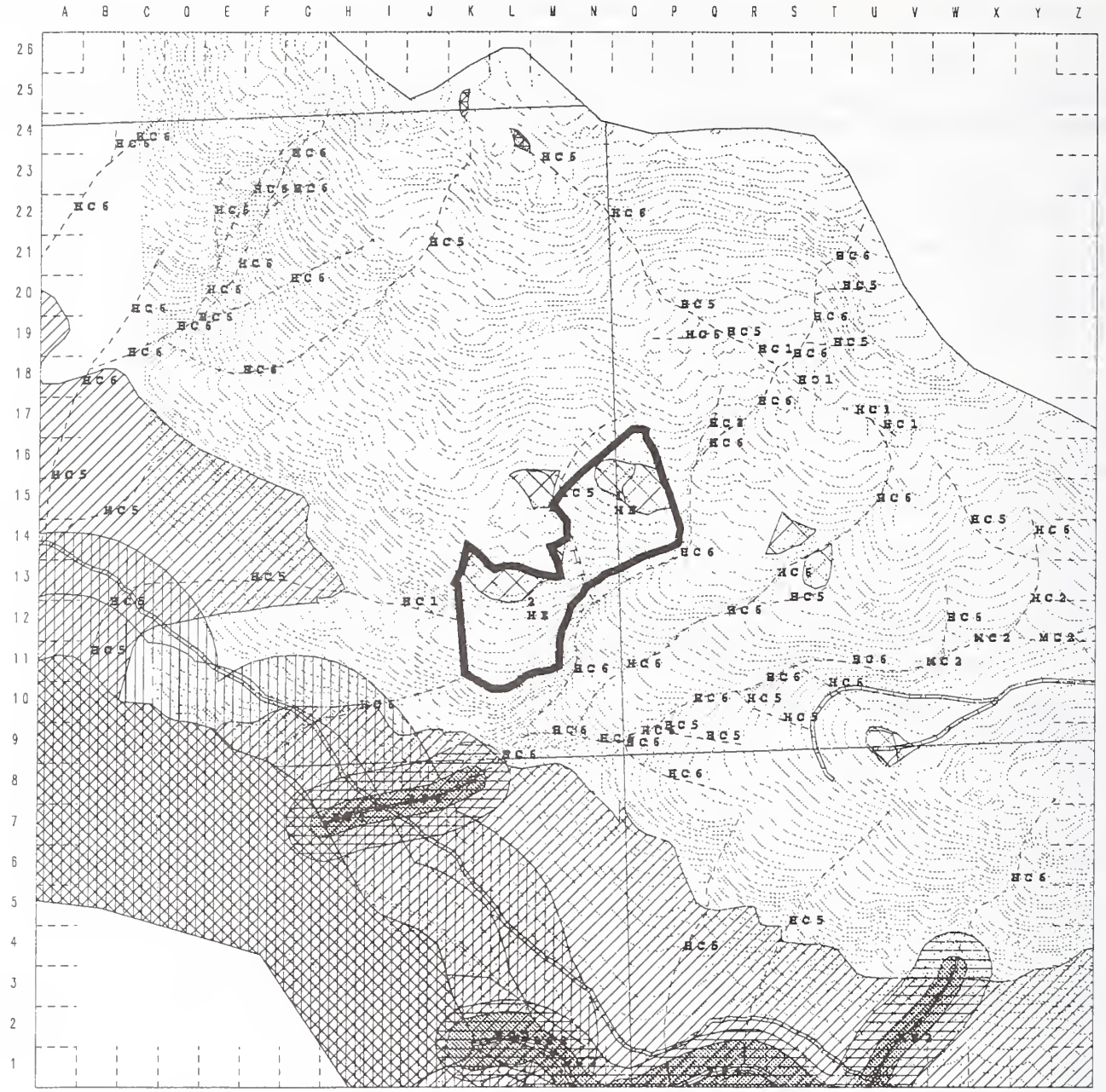
Geological Input
A V-notch is located along the south unit boundary (P-14 to M-10). See Fisheries/Watershed Input for recommendations. NRB 8/28/95

Silviculture Input
Moderate productivity, with small areas of high elevation and high mass movement soils. Apply shelterwood harvest system leaving all trees 13" DBH and under. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 17

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /1stiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream

Class 2 Stream

Class 3 Stream

Section Line

Planning Roads

Unit Boundary

Setting Line

Contour or Ortho Line

Beach or Estuary Buffer

Private Land

Implementation Buffer

Roadromous 300 ft. Buffer

Body of Water

Prior Harvest

Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline

HE Helicopter

HL High Lead

SL Slack Line

SH Shovel Yarding

Vols 4 - 14

Vols 5 - 22

Vols 6 - 0

Vols 7 - 0

Total Acres - 37

Potential MBF - 1162

Quarter Quad - KINDSSE

VCU Number - 737

Photo Number - 1790-63

Alternative Pattern - 20D50

★ Landing

Feet

0 526 1056 1582 2112

Projection - Stateplane

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 18 **Planned Acres:** 42.8 **Estimated Volume:** 1,259.7 **In Alternatives:** 2 , 0 , 0 , 0 , 7
Silvicultural System : See section **Number of Settings:** 3 **Quad:** KTNC5NE **Photo:** 1890-3 **Logging systems:** - RS- HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 1017 **Original LSTA Unit:** 744-513

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 40.7 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** E
Volume class breakdown: Class 4: 23.3 Class 5: 17.3 Class 6: 0.0 Class 7: 0.0 **Low Productive** 2.2
Visuals: Seen 42.8 Not Seen 0.0 **VQOs:** PR- 0.0 MM- 42.8 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 31.9 **Intermediate VAC** 11.0 **Low VAC** 0.0 **Roadless** 15.1
Riparian MA: Class 1 Stream: 0.4 Class 2 Stream: 0.0 Class 3 Stream: 4.8 Soils: 0.0
Mass movement Index: Low 0.3 Medium 34.9 High 7.7 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.2
Wetland Information: Wetland 7.2 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.3 2- 0.0 3- 42.5 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 9.6 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 34.8
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit contains forest wetlands (BMP 12.5). Recommend at least partial log suspension when harvesting this unit to minimize the disturbance of these wetlands (BMP 13.9). NRB 8/28/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Extend road past north Class III stream to allow for split yarding. Run profile to establish West unit boundary; logging systems analysis indicate that access road may have to be located further downslope and a Slackline yarding system utilized to attain adequate deflection to planned unit backline.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7) Oversteepened slopes may require full bench construction and endhaul waste. (BMP 14.7) Steelhead/Coho/Pink/Chum timing (July 18 - August 7) may apply for all road construction and/or drainage installations.

Fish/Watershed Input
Class III HC6 stream south: split yarding or full suspension required (BMP 13.16)

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
A portion of unit could be seen from Carroll Inlet. Identified VQO is maximum modification. Adjacent standing will help to screen unit. WEA 9/30/95

Lands Input
No concerns. NRB 8/28/95

Cultural Resource Input
No cultural resources identified. Final road locations for access across Carrol Creek will need to be reviewed during final layout. RL 9/30/95

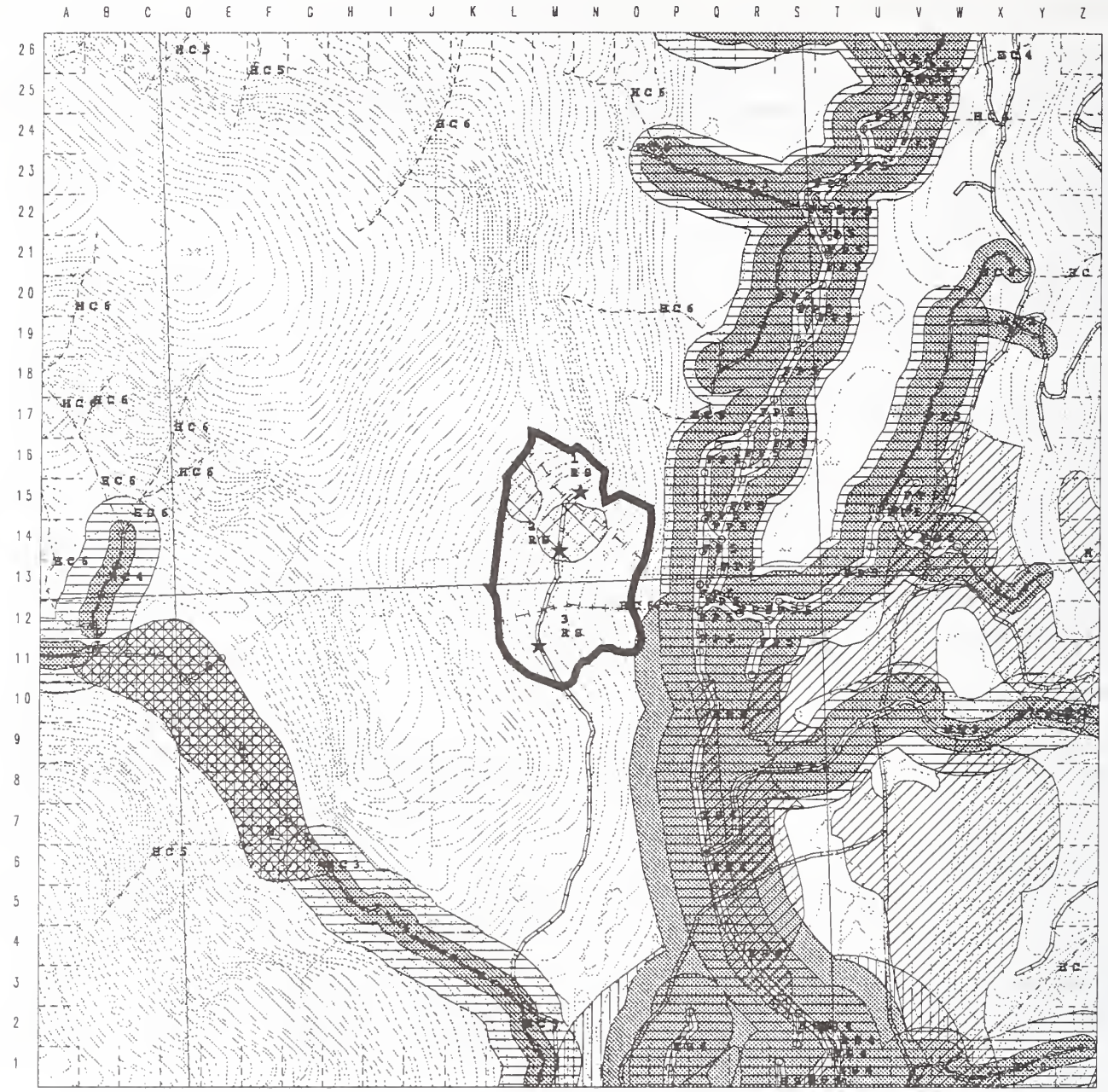
Geological Input
No concerns. NRB 8/28/95

Silviculture Input
Moderate volume, with small areas of Hydric soils that will need to be planted. (6 acres). Consideration should be given to a diameter limit cut leaving all trees 13" DBH and under standing if helicopter yarded. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 18

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-98, /fsfiles/ref/library/gis/upperc5/finalcord/fcord



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Volc 4 - 23
Volc 5 - 17
Volc 6 - 0
Volc 7 - 0
Total Acres - 43
Potential MBF - 1260
Quarter Quad - KINCSNE
VCU Number - 744
Photo Number - 1890-3
Alternative Pattern - 20007
★ Landing

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 19 **Planned Acres:** 49.2 **Estimated Volume:** 1,237.5 **In Alternatives:** 2 , 3 , 5 , 6 , 7
Silvicultural System : See section **Number of Settings:** 8 **Quad:** KTNC4NW **Photo:** 1573-187 **Logging systems:** - RS- HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 308 **Original LSTA Unit:** 744-308

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 0.0 Spruce 0.0 Mixed Hem/Spr 32.0 **Nonforested** 0.8 **Aspect:** SW
Volume class breakdown: Class 4: 2.8 Class 5: 29.3 Class 6: 0.0 Class 7: 0.0 **Low Productive** 16.4
Visuals: Seen 0.0 Not Seen 49.2 **VQOs:** PR- 0.0 MM- 49.2 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** SPNM **High VAC** 49.2 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 49.2
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.5 Class 3 Stream: 6.7 Soils: 0.0
Mass movement Index: Low 0.0 Medium 48.7 High 0.5 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.6
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 0.0 4- 49.2
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 40.8
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit contains some high landslide potential soils on upper slopes (L-15 to O-14) (BMP 13.5). Recommend at least partial log suspension when yarding (BMP 13.9). NRB 8/28/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Multiple Class III streams within this unit require road/landing locations that will allow split yarding.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7)

Fish/Watershed Input
Class II MM1 stream south (TTRA): 120 foot no cut buffer (BMP 12.6,12.6a)

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/28/95

Lands Input
No concerns. NRB 8/28/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

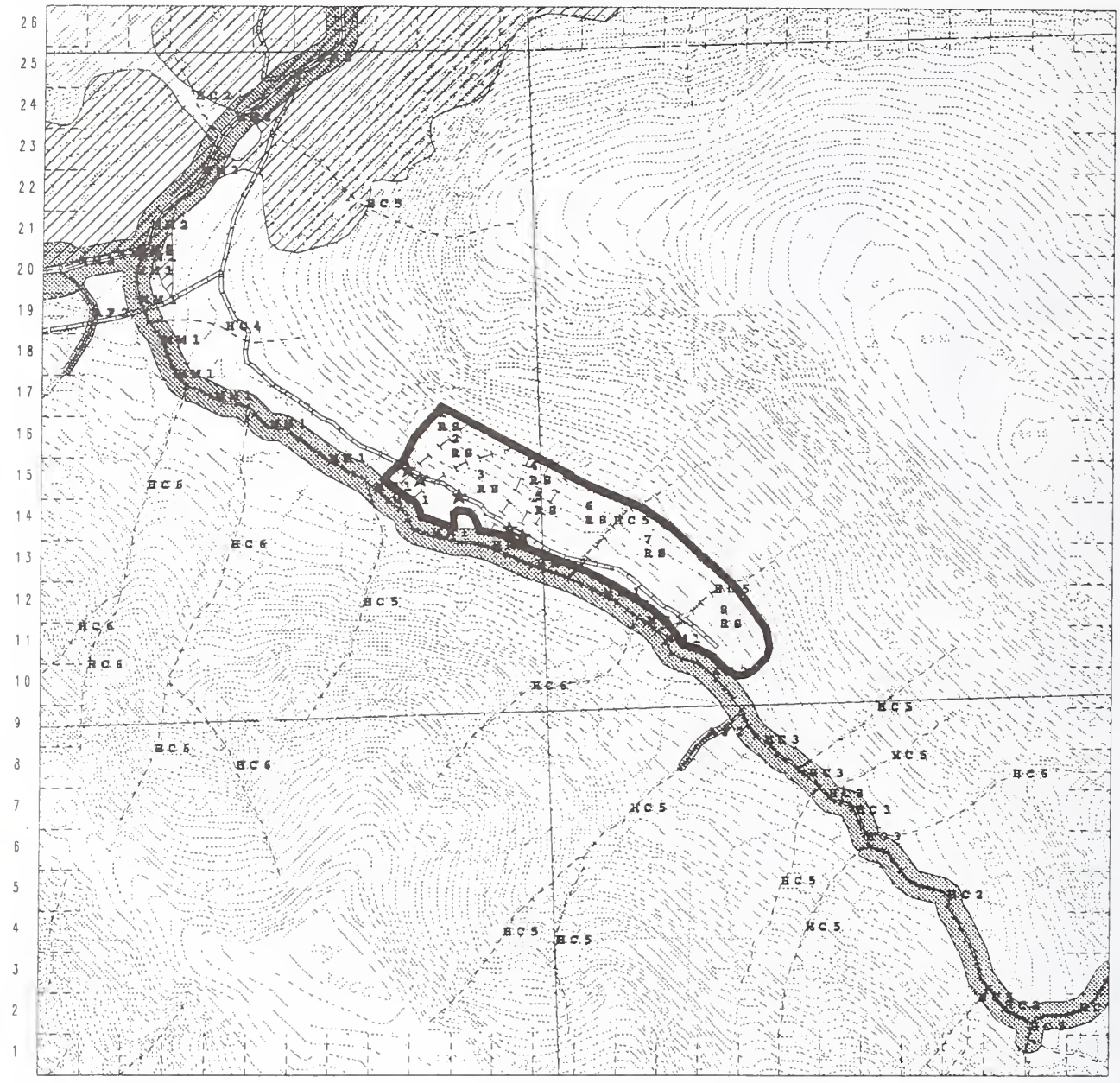
Geological Input
Unit is adjacent to an active avalanche tract (L-15 to K-14). Recommend that an avalanche-firm buffer of trees be maintained along the northeast unit boundary to protect regeneration from damage. NRB 8/28/95

Silviculture Input
Highly productive with small areas of high mass movement soils. Planting will be required. (5 acres) CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 19

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /isfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream

Class 2 Stream

Class 3 Stream

Section Line

Planning Roads

Unit Boundary

Setting Line

Contour or Ortho Line

Beach or Estuary Buffer

Private Land

Implementation Buffer

Anadromous 300 ft. Buffer

Body of Water

Prior Harvest

Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline

HE Helicopter

HL High Lead

SL Slack Line

SH Shovel Yarding

Volc 4 - 3

Volc 5 - 29

Volc 6 - 0

Volc 7 - 0

Total Acres - 49

Potential MBF - 1238

Quarter Quad - KINC4NW

VCU Number - 744

Photo Number - 1573-187

Alternative Pattern - 230567

★ Landing

Projection - Stateplane

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 20 **Planned Acres:** 43.6 **Estimated Volume:** 383.9 **In Alternatives:** 2 , 3 , 5 , 6 , 7
Silvicultural System : See section **Number of Settings:** 3 **Quad:** KTNC4NW **Photo:** 1890-49 **Logging systems:** - RS- HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 310 **Original LSTA Unit:** 744-310

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 0.0 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** SW
Volume class breakdown: Class 4: 0.0 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 43.6
Visuals: Seen 0.0 Not Seen 43.6 **VQOs:** PR- 0.0 MM- 43.6 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 43.6 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.1 Class 3 Stream: 6.1 Soils: 0.0
Mass movement Index: Low 0.0 Medium 41.2 High 2.5 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 2.5
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 0.0 4- 43.6
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 0.0
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
A small area (G-17), about 5 acres, of forested wetland and non-forested muskeg is located in the west-central part of unit (BMP 12.5). This area is suitable for shovel logging (BMP 13.9). NRB 8/28/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Determine eastern boundary with profiles; a slope break with potential blind lead may cause the boundary to be moved downhill.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7) Relocate road through muskeg to avoid populations of Choris bog orchids.

Fish/Watershed Input
Class II MM1 stream southwest (TTRA): 120 foot no cut buffer (BMP 12.6, 12.6a)
Class III HC6 stream central: split yarding and full suspension required (BMP13.19)

Wildlife Input
Maintain distribution of snags by leaving 1-5 acre-sized islands of green trees at a rate of 1 acre of island for every 20 acres of harvest. Leave islands must be compatible with logging systems and safe working conditions.

Recreation / Visuals Input
No Concerns WEA 8/28/95

Lands Input
No concerns. NRB 8/28/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

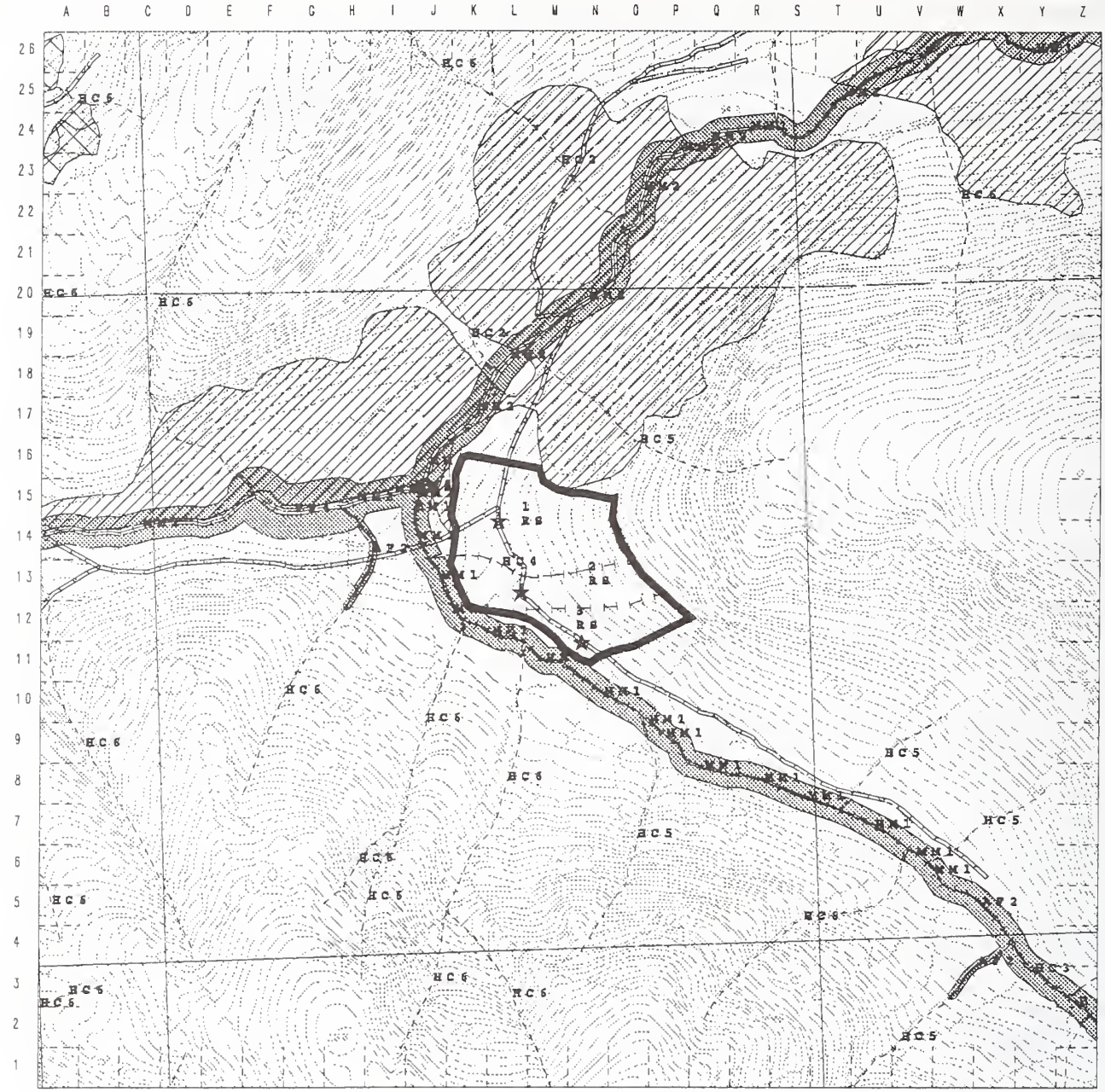
Geological Input
Unit is located adjacent to avalanche tract (L-15 to J-14). Recommend an avalanche firm buffer of trees be left along the southeast unit boundary to protect regeneration from avalanches. NRB 8/28/95

Silviculture Input
Highly productive with small areas of high mass movement soils. Planting will be required, using Alaska yellow cedar if available. (6 acres)CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 20

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fs1files/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Roadromous 100 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Volc 4 - 0
Volc 5 - 0
Volc 6 - 0
Volc 7 - 0
Total Acres - 44
Potential MBF - 384
Quarter Quad - KINC4NW
VCU Number - 744
Photo Number - 1890-49
Alternative Pattern - 230567

★ Landing

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 21 **Planned Acres:** 7.7 **Estimated Volume:** 206.4 **In Alternatives:** 2 , 3 , 5 , 6 , 7
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC4NW **Photo:** 1890-49 **Logging systems:** - RS- HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 NOI Unit: 313 **Original LSTA Unit:** 744-313

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 7.4 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** N
Volume class breakdown: Class 4: 7.4 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.3
Visuals: Seen 0.0 Not Seen 7.7 **VQOs:** PR- 0.0 MM- 7.7 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 7.7 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 1.6 Soils: 0.0
Mass movement Index: Low 0.0 Medium 7.7 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 1.2
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 0.0 4- 7.7
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 1.6 River Otter- 1.6 Bald Eagle- 1.6 Black Bear- 7.7
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
No concerns. NRB 8/28/95

Timber Input
Planned logging systems design for this unit is Running Skyline. A slope break and potential blind lead may cause the south unit boundary to be move downhill; run profiles to verify logging feasibility. Also, field reconnaissance shows that there is a lack of adequate runout for the proposed landing. Confirm final road and landing locations. Change to Helicopter yarding if landing or blindlead is unfeasible.

Engineering Input
There are no engineering mitigation measures anticipated for this unit.

Fish/Watershed Input
Class III HC6 stream east: 75 foot sideslope buffer (BMP 12.6)

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/28/95

Lands Input
No concerns. NRB 8/28/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
No concerns. NRB 8/28/95

Silviculture Input
High productivity. Potential for severe brush competition exists. Plant Sitka spruce. (7 acres) CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 21

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Volc 4 - 7
Volc 5 - 0
Volc 6 - 0
Volc 7 - 0
Total Acres - 8
Potential MBF - 206
Quarter Quad - XTNC4NW
VCU Number - 744
Photo Number - 1890-49
Alternative Pattern - 230567
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 22 **Planned Acres:** 33.4 **Estimated Volume:** 1,125.6 **In Alternatives:** 2 , 3 , 5 , 6 , 7
Silvicultural System : See section **Number of Settings:** 5 **Quad:** KTNC4NW **Photo:** 1573-188 **Logging systems:** - RS- HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 327 **Original LSTA Unit:** 744-327

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 32.3 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect: S**
Volume class breakdown: Class 4: 0.0 Class 5: 32.3 Class 6: 0.0 Class 7: 0.0 **Low Productive** 1.1
Visuals: Seen 0.0 Not Seen 33.4 **VQOs:** PR- 0.0 MM- 33.4 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 33.4 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 6.3 Soils: 2.2
Mass movement Index: Low 2.2 Medium 26.7 High 4.6 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 2.2 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 1.7 4- 31.6
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 16.2 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 33.4
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
The upper slopes (K-13 to M-15) in this unit have a high potential for landslide activity, MMI=3 (BMP 13.5). At least partial log suspension is recommended in yarding to minimize soil disturbance (BMP 13.9). NRB 8/28/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Run profiles on north unit boundary to determine boundary location.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7)

Fish/Watershed Input
Class II MM1 stream south (TTRA): 120 no cut buffer(BMP 12.6, 12.6a)
Class III HC6 stream central: split yarding and full suspension required (BMP 13.16).

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No Concerns WEA 8/28/95

Lands Input
No concerns. NRB 8/28/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

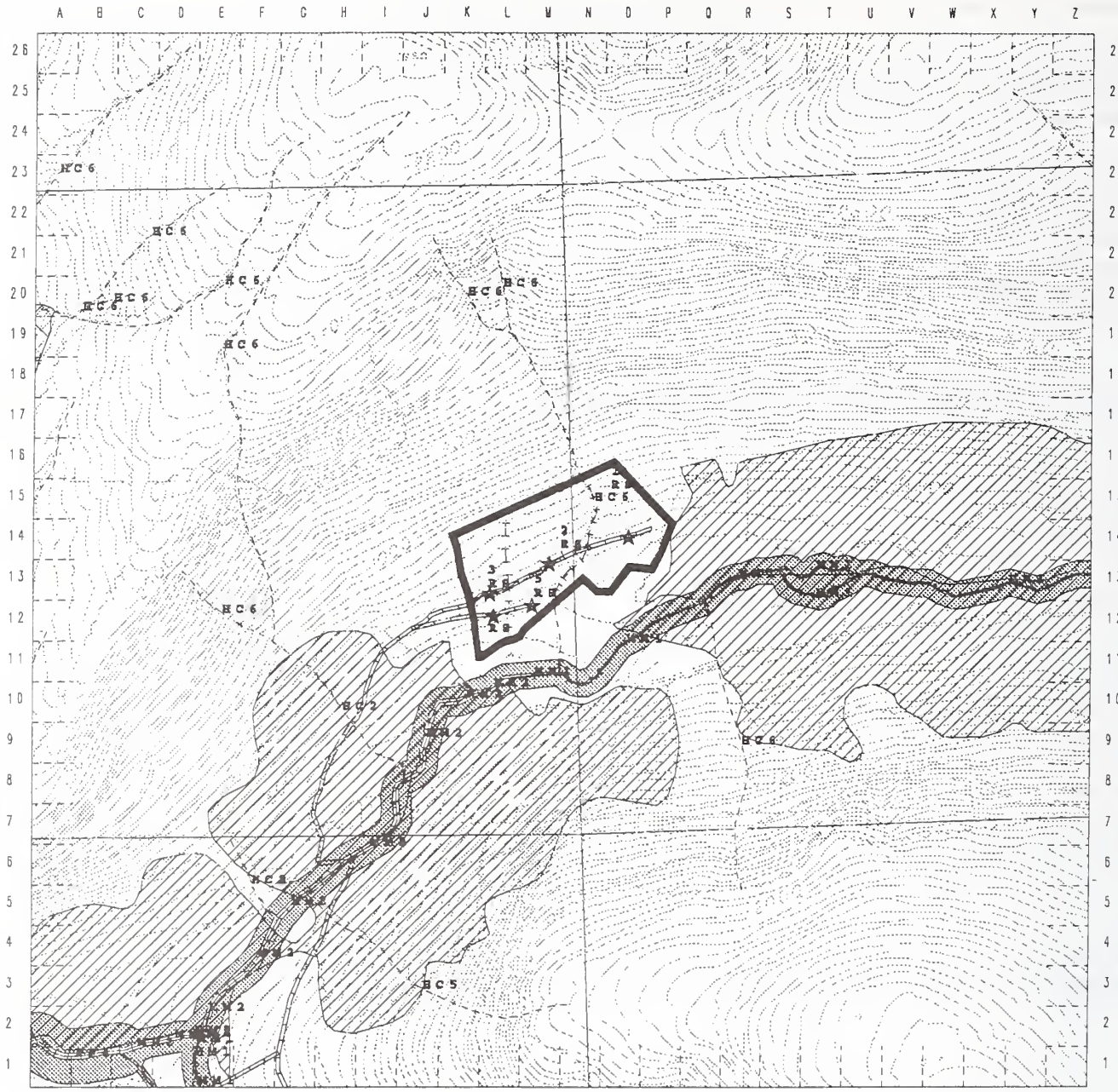
Geological Input
No concerns. NRB 8/28/95

Silviculture Input
High prodctivity, with small areas of high elevation and high mass movement soils. Plant Alaska yellow cedar if available. (15 acres) CBG 10/15/95

Upper Carroll Study Area Unit Schematic - Final Unit 22

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /isfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vole 4 - 0
Vole 5 - 32
Vole 6 - 0
Vole 7 - 0
Total Acres - 33
Potential MBF - 1126
Quarter Quad - KTNC4NW
VCU Number - 744
Photo Number - 1573-188
Alternative Pattern - 230567
★ Landing

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Feet

0 528 1056 1582 2112

Projection - Stateplane

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 24 **Planned Acres:** 30.0 **Estimated Volume:** 1,355.1 **In Alternatives:** 2 , 0 , 0 , 0 , 0
Silvicultural System : See section **Number of Settings:** 2 **Quad:** KTNC5NE **Photo:** 1890-2 **Logging systems:** - SL
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 338 **Original LSTA Unit:** 744-338

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 30.0 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** W
Volume class breakdown: Class 4: 0.0 Class 5: 0.0 Class 6: 30.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 30.0 Not Seen 0.0 **VQOs:** PR- 0.0 MM- 0.0 M- 30.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 22.5 **Low VAC** 7.5 **Roadless** 20.4
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 1.4 Soils: 0.0
Mass movement Index: Low 0.0 Medium 14.5 High 15.5 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 4.4
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 0.0 4- 30.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 17.6
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
The upper slopes of this harvest unit (M-15 and N-12), areas above the road, have a high potential for landslides, MMI=3 (BMP 13.5). Recommend that at least partial log suspension be acheived when yarding down these slopes (BMP 13.9). Shallow soils in this unit are subject to blowdown. Do not recommend any partial cuts in this unit. NRB 8/29/95

Timber Input
Planned logging systems design for this unit is Slackline. Confirm final road and landing locations.

Engineering Input
High MMI soils. Road construction must minimize landslide potential (BMP 14.7)
Oversteepened slopes may require full bench construction and enhaul of waste. (BMP 14.7)

Fish/Watershed Input
Class III HC5 stream east: sideslope buffer (BMP 12.6).

Wildlife Input
Harvest operations restricted to April 1 to October 31 to protect trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit may be seen from Carroll Inlet. Identified VQO is modification. Beach and estuary buffer in conjunction with adjacent standing timber will help screen unit. WEA 9/30/95

Lands Input
No concerns. NRB 8/29/05

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
No concerns. NRB 8/29/95

Silviculture Input
Highly productive with small areas of high elevation and high mass movement soils. Planting will be required, using Alaska yellow cedar if available. (3 acres) CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 24

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /isfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beech or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vole 4 - 0
Vole 5 - 0
Vole 6 - 30
Vole 7 - 0
Total Acres - 30
Potential WBF - 1355
Quarter Quad - KTNC5NE
VCU Number - 744
Photo Number - 1890-2
Alternative Pattern - 20000
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet
0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 27 **Planned Acres:** 21.1 **Estimated Volume:** 951.8 **In Alternatives:** 0 , 3 , 5 , 0 , 7
Silvicultural System : See section **Number of Settings:** 2 **Quad:** KTNC5NE **Photo:** 1673-160 **Logging systems:** - RS- HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D71A **WAA Number:** 510 **NOI Unit:** 345 **Original LSTA Unit:** 744-345

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 0.0 Spruce 0.0 Mixed Hem/Spr 21.1 **Nonforested** 0.0 **Aspect:** NW
Volume class breakdown: Class 4: 0.0 Class 5: 0.0 Class 6: 21.1 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 21.1 Not Seen 0.0 **VQOs:** PR- 1.2 MM- 0.0 M- 19.9 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 21.1 **Low VAC** 0.0 **Roadless** 9.1
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 5.9 Soils: 0.0
Mass movement Index: Low 0.0 Medium 19.3 High 1.9 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 0.0 4- 21.1
High Value Habitat: Sitka Black-Tail Deer- 9.6 Marten- 13.4 River Otter- 3.8 Bald Eagle- 3.8 Black Bear- 21.1
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
The upper slopes in this unit (L-12 and O-12), above the road, have a high potential for landslides, MMI=3 (BMP13.5). Recommend at least partial log suspension when yarding (BMP 13.9). NRB 8/29/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations.outheastern corner of planned unit appears to be a blindlead. Verify and modify unit boundary as required. Ifupper road is not required for other units, switch logging systems design to helicopter.

Engineering Input
High MMI soils. Road construction must minimize landslide potential (BMP 14.7)versteepened slopes may require full bench construction and endhaul ofwaste. (BMP 14.7)oho/Pink timing (June 1 - August 7) may apply for all road construction and/or drainage installations (BMP 14.6)

Fish/Watershed Input
One water quality stream flows through the northeast corner of this unit (BMP 12.6a). SPL 1/3/95 Recommend thatyarding be split on these streams and that full log suspension be maintained when yarding across the stream (BMP13.9), trees be felled away from the stream course and slash be removed within 48 hours (BMP 13.16). NRB 9/18/95

Wildlife Input
Harvest operations restricted to April 1 to October 31 to protect trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit may be visable from Carroll estuary. Identified VQO is modification. Adjacent uncut units will help to screen unit. WEA 9/30/95

Lands Input
No concerns. NRB 8/29/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

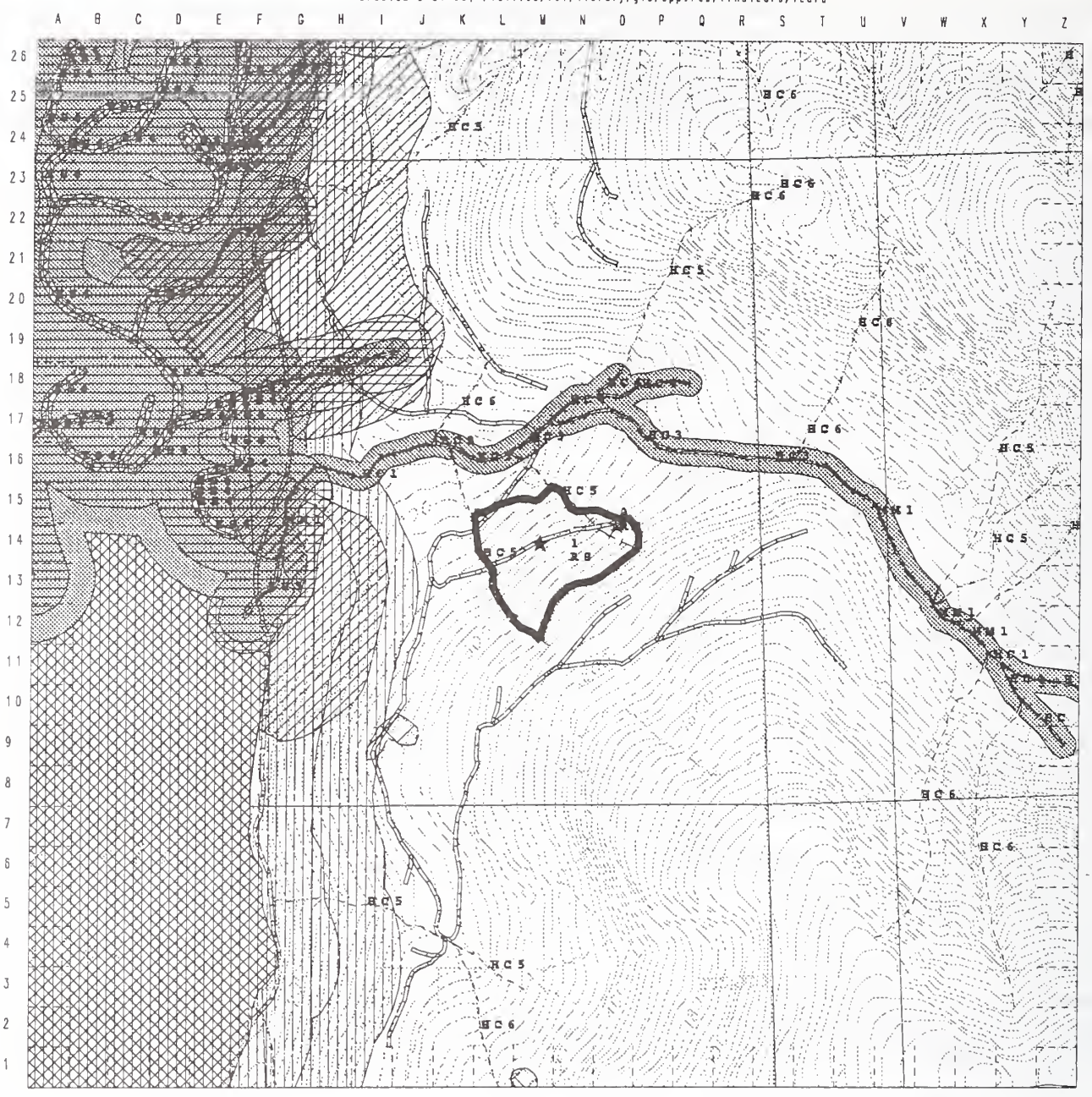
Geological Input
No concerns. NRB 8/29/95

Silviculture Input
Highly productive with small areas of high elevation and high mass movement soils. Planting may be necessary, usingAlaska yellow cedar if available. (5 acres) Consideration should be given to a diameter limit cut leaving all trees 13" DBH and under standing if helicopter yarded. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 27

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /tstiles/ref/library/gis/upperc5/finalcard/fcard


A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
HC5
HC6
HC6
HC5
HC6
HC6
HC5
HC6
HC5
HC5
HC5
HC6
HC6
HC5
HC5
HC6
HC6
HC5
HC5
HC6
HC6

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 28 **Planned Acres:** 15.1 **Estimated Volume:** 680.9 **In Alternatives:** 2 , 3 , 5 , 6 , 7
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC5NE **Photo:** 1673-160 **Logging systems:** - RS- HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D71A **WAA Number:** 510 **NOI Unit:** 346 **Original LSTA Unit:** 744-346

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 6.2 Spruce 0.0 Mixed Hem/Spr 8.9 **Nonforested** 0.0 **Aspect:** NW
Volume class breakdown: Class 4: 0.0 Class 5: 0.0 Class 6: 15.1 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 15.1 Not Seen 0.0 **VQOs:** PR- 13.2 MM- 0.0 M- 1.9 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 9.6 **Low VAC** 5.5 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 3.2 Soils: 0.0
Mass movement Index: Low 0.0 Medium 15.1 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 0.0 4- 15.1
High Value Habitat: Sitka Black-Tail Deer- 9.6 Marten- 13.8 River Otter- 4.2 Bald Eagle- 0.0 Black Bear- 13.8
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
No concerns. NRB 8/29/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Northeastern corner of planned unit maybe a blindlead depending on final access road location.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7) Pink/Chum timing (June 1 - August 7) may apply for all road construction and/or drainage installations (BMP14.6)..

Fish/Watershed Input
A HC5 water quality stream flows through the middle of this unit (BMP 12.6a). SPL 1/3/95 Recommend that yarding be split on these streams and that full log suspension be maintained when yarding across the stream (BMP 13.2), trees be felled away from the stream course and slash be removed within 48 hours (BMP 13.16). Variable width slope-break buffers may also be required for HC5 water quality stream located along eastern boundary. (BMP 12.6a) NRB 9/18/95

Wildlife Input
Harvest operations restricted to April 1 to October 31 to protect trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit may be visable from Carroll estuary. Identified VQO is partial retention. Beach and estuary buffer will help screen unit. WEA 9/30/95

Lands Input
No concerns. NRB 8/29/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

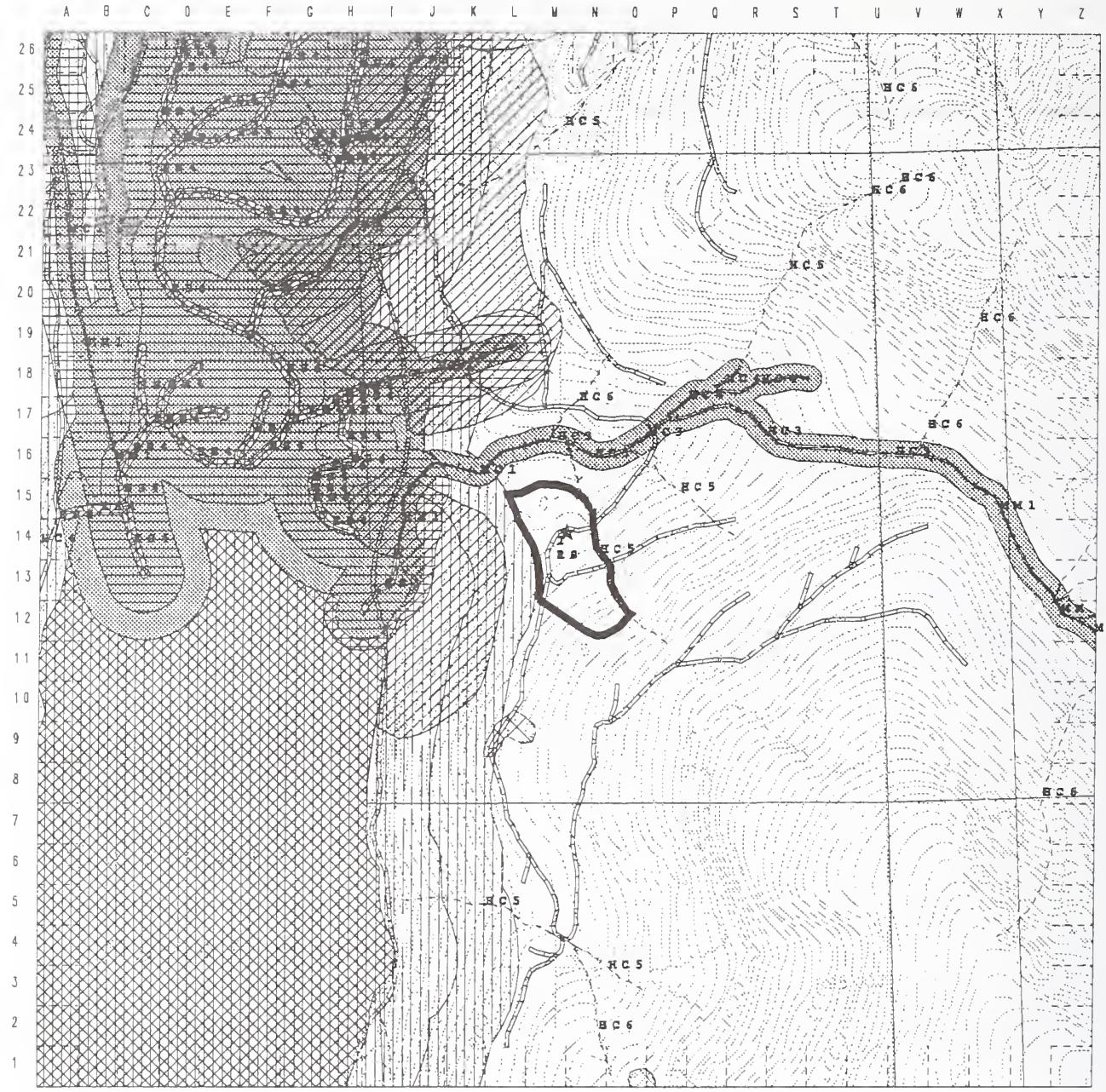
Geological Input
No concerns. NRB 8/29/95

Silviculture Input
Highly productive with small areas of high elevation and high mass movement soils. Planting will be required, using Alaska yellow cedar if available. (3 acres) Consideration should be given to a diameter limit cut leaving all trees 13" DBH and under standing if helicopter yarded. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 28

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /tstiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Volc 4 - 0
Volc 5 - 0
Volc 6 - 15
Volc 7 - 0
Total Acres - 15
Potential MBF - 681
Quarter Quad - X1NC5NE
VCU Number - 744
Photo Number - 1673-160
Alternative Pattern - 230567
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 29 **Planned Acres:** 5.9 **Estimated Volume:** 225.7 **In Alternatives:** 2 , 0 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC5NE **Photo:** 1890-1 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D72A **WAA Number:** 510 **NOI Unit:** 347 **Original LSTA Unit:** 744-347

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 3.8 Spruce 0.0 Mixed Hem/Spr 2.1 **Nonforested** 0.0 **Aspect:** NW
Volume class breakdown: Class 4: 0.0 Class 5: 3.8 Class 6: 2.1 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 5.9 Not Seen 0.0 **VQOs:** PR- 5.9 MM- 0.0 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 0.1 **Low VAC** 5.8 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 0.0 Medium 5.9 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 0.0 4- 5.9
High Value Habitat: Sitka Black-Tail Deer- 0.1 Marten- 0.1 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 5.8
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
No concerns. NRB 8/29/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations.

Engineering Input
There are no engineering mitigaiton measures anticipated for this unit.

Fish/Watershed Input
No concerns. SPL 1/3/95

Wildlife Input
Harvest operations restricted to April 1 to October 31 to protect trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit may be visable from Carroll estuary. Identified VQO is partial retention. Beach and estuary buffer will help to screen unit. WEA 9/30/95

Lands Input
No concerns. NRB 8/29/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

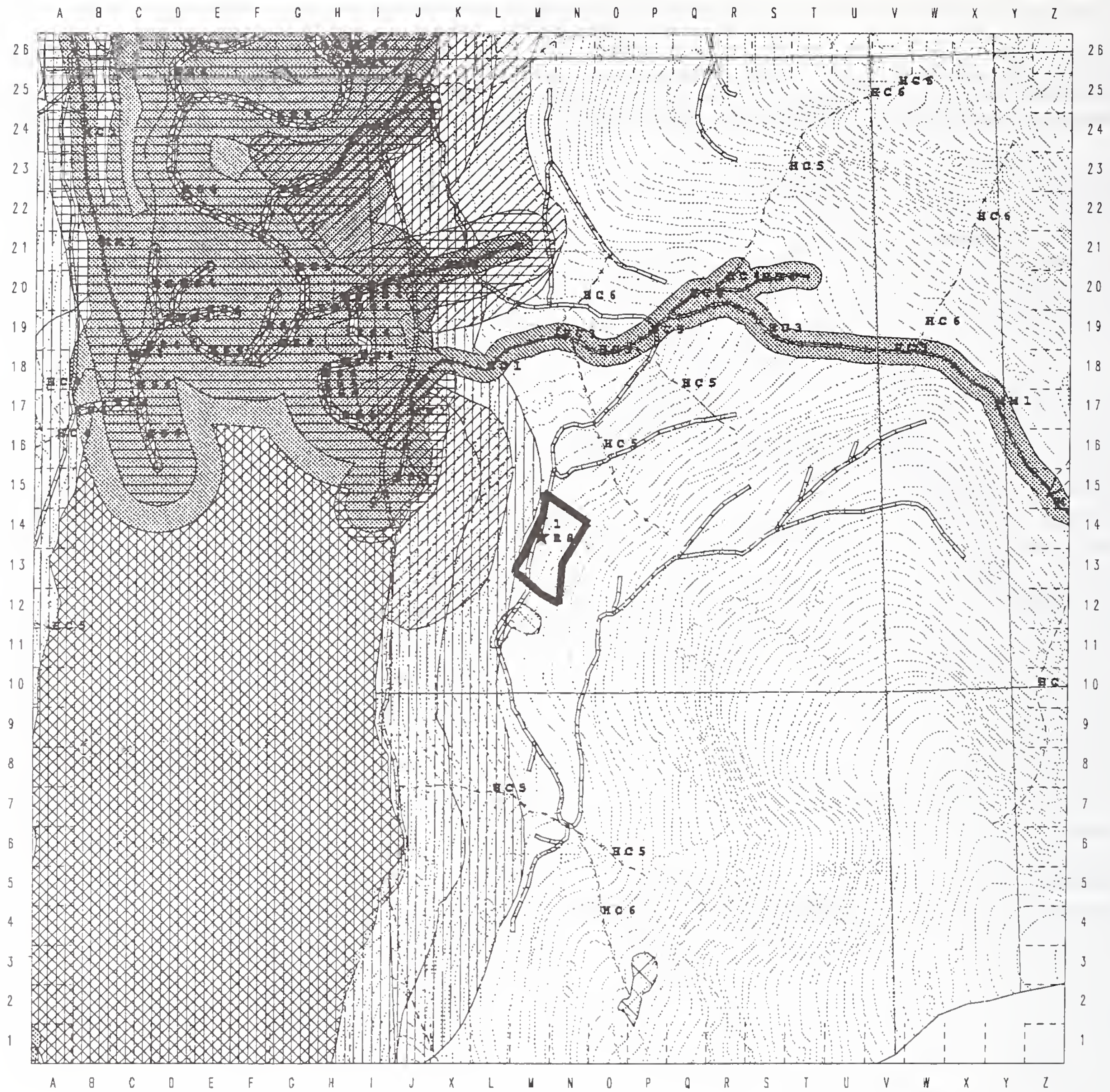
Geological Input
No concerns. NRB 8/29/95

Silviculture Input
High productivity with good natural regeneration. No concerns. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 29

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /tsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream

Class 2 Stream

Class 3 Stream

Section Line

Planning Roads

Unit Boundary

Setting Line

Contour or Ortho Line

Beach or Estuary Buffer

Private Land

Implementation Buffer

Anadromous 100 ft. Buffer

Body of Water

Prior Harvest

Updates to Wetlands

Volc 4 - 0

Volc 5 - 4

Volc 6 - 2

Volc 7 - 0

Total Acres - 6

Potential MBF - 226

Quarter Quad - K1NC5NE

VCU Number - 744

Photo Number - 1890-1

Alternative Pattern - 200560

★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline

HE Helicopter

HL High Lead

SL Slack Line

SH Shovel Yarding

Projection - Stateplane

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 30 **Planned Acres:** 20.2 **Estimated Volume:** 755.9 **In Alternatives:** 2 , 0 , 0 , 0 , 0
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC5NE **Photo:** 1673-160 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D71A **WAA Number:** 510 **NOI Unit:** 348 **Original LSTA Unit:** 744-348

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 14.9 Spruce 0.0 Mixed Hem/Spr 5.4 **Nonforested** 0.0 **Aspect:** NW
Volume class breakdown: Class 4: 0.0 Class 5: 14.9 Class 6: 5.4 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 20.2 Not Seen 0.0 **VQOs:** PR- 3.2 MM- 0.0 M- 17.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 14.1 **Low VAC** 6.1 **Roadless** 5.5
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 1.2 Soils: 0.0
Mass movement Index: Low 0.0 Medium 18.4 High 1.8 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 0.0 4- 20.2
High Value Habitat: Sitka Black-Tail Deer- 0.6 Marten- 0.6 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 20.0
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
No concerns. NRB 8/29/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Northeastern corner of planned unit crosses a Class III stream. Verify full suspension over stream and modify unit boundary as required.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7)

Fish/Watershed Input
One water quality stream flows through the north corner of this unit (BMP 12.6a). SPL 1/3/95 Recommend that yarding be split on this stream and that full log suspension be maintained when yarding across the stream (BMP 13.9), trees be felled away from the stream-course and slash be removed within 48 hours (BMP 13.16).

Wildlife Input
Harvest operations restricted to April 1 to October 31 to protect trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit may be visable from Carroll Inlet. Identified VQO is modification. Beach, estuary and adjacent uncut units will help to mollify visual impact. WEA 9/30/95

Lands Input
No concerns. NRB 8/29/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

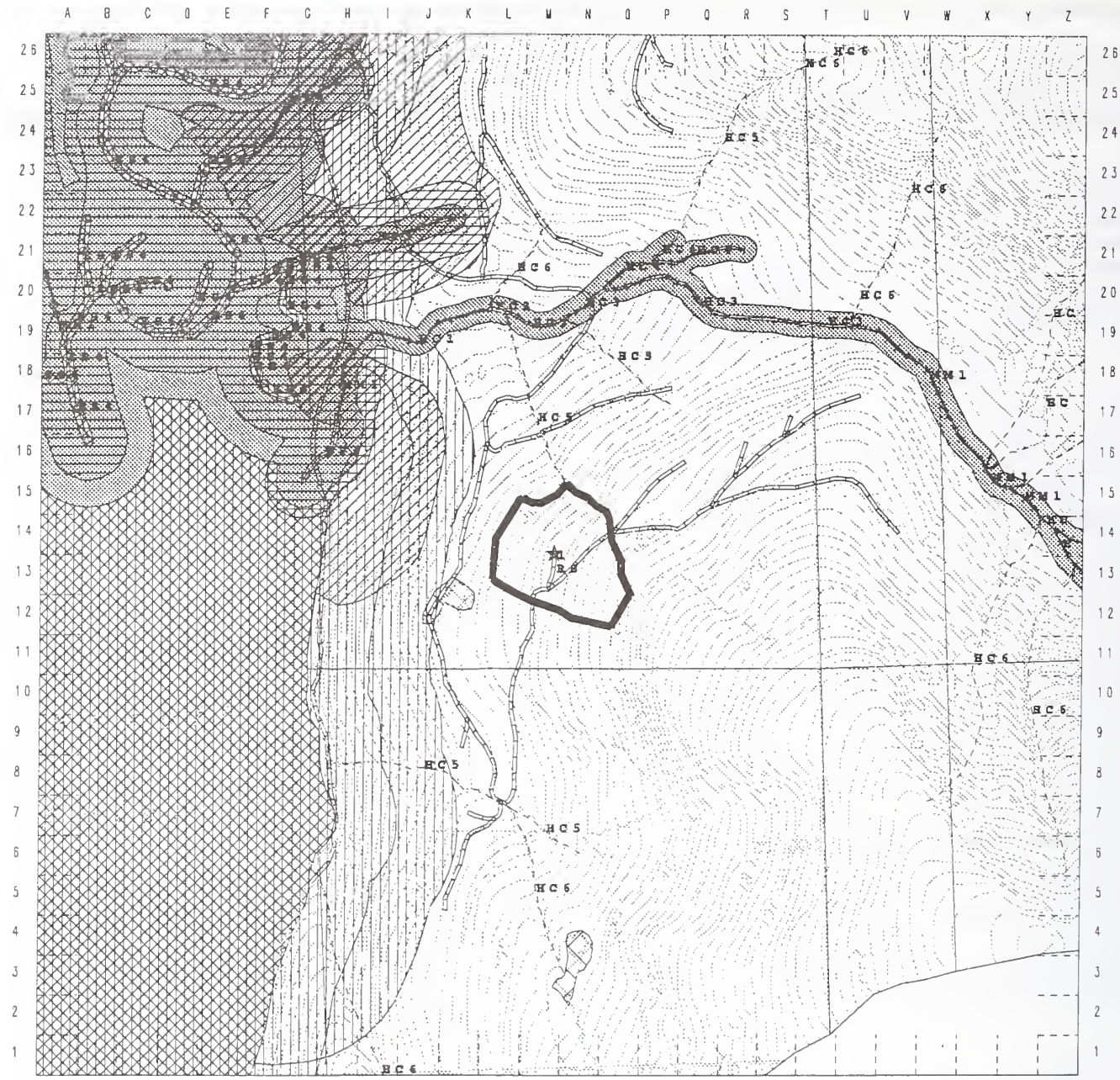
Geological Input
No concerns. NRB 8/29/95

Silviculture Input
High productivity. No concerns. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 30

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vols 4 - 0
Vols 5 - 15
Vols 6 - 5
Vols 7 - 0
Total Acres - 20
Potential MBF - 756
Quarter Quad - E1NC5NE
VCU Number - 744
Photo Number - 1675-160
Alternative Pattern - 20000
★ Landing

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet
0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 35 **Planned Acres:** 21.9 **Estimated Volume:** 713.5 **In Alternatives:** 2 , 3 , 5 , 6 , 7
Silvicultural System : See section **Number of Settings:** 3 **Quad:** KTNC5NE **Photo:** 1673-159 **Logging systems:** - RS- HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D72A **WAA Number:** 510 **NOI Unit:** 353 **Original LSTA Unit:** 744-353

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 20.2 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** NW
Volume class breakdown: Class 4: 0.0 Class 5: 20.2 Class 6: 0.0 Class 7: 0.0 **Low Productive** 1.7
Visuals: Seen 21.9 Not Seen 0.0 **VQOs:** PR- 15.5 MM- 0.0 M- 6.4 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 9.9 **Low VAC** 12.0 **Roadless** 8.9
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 8.0 Soils: 0.0
Mass movement Index: Low 0.0 Medium 21.9 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 3.0 4- 19.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 12.0 River Otter- 0.2 Bald Eagle- 0.0 Black Bear- 21.9
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
No concerns. NRB 8/29/95

Timber Input
Planned logging systems design for this unit is Running Skyline and Helicopter. Confirm final road and landing locations. 1000' estuary buffer required.

Engineering Input
Pink/Chum timing (June 1 - August 7) may apply for all road construction and/or drainage installations (BMP 14.6)

Fish/Watershed Input
Two water quality streams (HC5 central and HC6 south) are located in this unit (BMP 12.6a). SPL 1/3/95 Recommend that yarding be split on these streams and that full log suspension be maintained when yarding across the stream (BMP 13.3), trees be felled away from the stream-course and slash be removed within 48 hours (BMP 13.16). Variable width slope-break buffers may also be required (BMP 12.6a) NRB 9/18/95

Wildlife Input
Harvest operations restricted to April 1 to October 31 to protect trumpeter swan resting/feeding areas. Modify the west unit boundary to avoid the 1,000 foot estuary buffer.

Recreation / Visuals Input
Unit may be seen from Carroll Inlet. Identified VQO is partial retention. Beach and estuary buffer will help to screen unit. WEA 9/30/95

Lands Input
No concerns. NRB 8/29/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
No concerns. 8/29/95

Silviculture Input
Moderate productivity. Consideration should be given to a diameter limit cut leaving all trees 13" DBH and under standing in helicopter portion. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 35

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96. /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Volc 4 - 0
Volc 5 - 20
Volc 6 - 0
Volc 7 - 0
Total Acres - 22
Potential MBF - 713
Quarter Quad - KTNC5NE
VCU Number - 744
Photo Number - 1673-159
Alternative Pattern - 230567
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet
0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 37 **Planned Acres:** 26.8 **Estimated Volume:** 767.7 **In Alternatives:** 2 , 0 , 0 , 0 , 7
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC5NE **Photo:** 1673-159 **Logging systems:** - RS- HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D72A **WAA Number:** 510 **NOI Unit:** 355 **Original LSTA Unit:** 744-355

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 20.7 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** W
Volume class breakdown: Class 4: 0.0 Class 5: 20.7 Class 6: 0.0 Class 7: 0.0 **Low Productive** 6.1
Visuals: Seen 26.8 Not Seen 0.0 **VQOs:** PR- 1.0 MM- 0.0 M- 25.8 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** SPNM **High VAC** 0.0 **Intermediate VAC** 25.9 **Low VAC** 0.9 **Roadless** 26.4
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 3.9 Soils: 0.0
Mass movement Index: Low 0.0 Medium 14.8 High 12.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information. Wetland 2.1 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 24.3 4- 2.5
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 20.8
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit consists mostly of high landslide potential soils, MMI=3 (BMP 13.5). At least partial log suspension is recommended when yarding (BMP 13.9). Unit includes some forested wetlands, supporting low productivity mixed conifer stands (BMP 12.5). Again partial log suspension is recommended when yarding these sites (BMP 13.9). NRB 8/29/95

Timber Input
Planned logging systems design for this unit is Helicopter.

Engineering Input
High MMI soils. Road construction must minimize landslide potential (BMP 14.7) Oversteepened slopes may require fullbench construction and endhaul of waste. (BMP 14.7)

Fish/Watershed Input
Class III HC6 nothwest: split yarding and full suspension required (BMP 13.9).

Wildlife Input
Harvest operations restricted to April 1 to October 31 to protect trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit may be seen from Carroll Inlet. Identified VQO is modification. Adjacent uncut timber and partial cutting will help to mollify visual impact. WEA 9/30/95

Lands Input
No concerns. NRB 8/29/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
No concerns. NRB 8/29/95

Silviculture Input
Highly productive with small areas of high elevation and high mass movement soils. Apply shelterwood harvest systemleaving all trees 13" DBH and under standing. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 37

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fstiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vole 4 - 0
Vole 5 - 21
Vole 6 - 0
Vole 7 - 0
Total Acres - 27
Potential MBF - 768
Quarter Quad - KINCSNE
VCU Number - 744
Photo Number - 1873-159
Alternative Pattern - 20007
★ Landing

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 38 **Planned Acres:** 10.7 **Estimated Volume:** 370.4 **In Alternatives:** 0 , 3 , 5 , 6 , 7
Silvicultural System : See section **Number of Settings:** 2 **Quad:** KTNC5NE **Photo:** 1673-159 **Logging systems:** - RS- HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D72A **WAA Number:** 510 **NOI Unit:** 356 **Original LSTA Unit:** 744-356

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 10.7 **Spruce** 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** NW
Volume class breakdown: Class 4: 0.0 Class 5: 10.7 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 10.7 Not Seen 0.0 **VQOs:** PR- 10.6 MM- 0.0 M- 0.1 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 2.5 **Low VAC** 8.2 **Roadless** 0.1
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 0.0 Medium 10.0 High 0.8 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.8 Mix Wetland 0.0 Riparian Soil 0.0 Site Productivity Classes 1- 0.0 2- 0.0 3- 0.8 4- 10.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 4.8 River Otter- 4.8 Bald Eagle- 0.0 Black Bear- 10.7
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
No concerns. NRB 8/29/95

Timber Input
Planned logging systems design for this unit is Running Skyline and Helicopter. Confirm final road and landing locations.

Engineering Input
High MMI soils. Road construction must minimize landslide potential (BMP 14.7)

Fish/Watershed Input
No concerns. SPL 1/3/95

Wildlife Input
Harvest operations restricted to April 1 to October 31 to protect trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit may be seen from Carroll Inlet. Identified VQO is partial retention. Beach buffer and uncut adjacent standing timber will help screen unit. Partial cutting along the top of unit will mollify visual impact also.

Lands Input
No concerns. 8/29/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
No concerns. 8/29/95

Silviculture Input
High productivity. Apply shelterwood harvest system leaving all trees 13" DBH and under standing. CBG 10/16 95

Upper Carroll Study Area Unit Schematic - Final Unit 38

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fistiles/ref/library/gis/upperc5/finalcard/fcard


HC5
HC6
HC6
HC5
HC6
HC6
HC5
HC6
HC5
HC6
HC5

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 40 **Planned Acres:** 6.1 **Estimated Volume:** 274.8 **In Alternatives:** 0 , 0 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC5NE **Photo:** 1673-160 **Logging systems:** - RS- HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D71A **WAA Number:** 510 **NOI Unit:** 358 **Original LSTA Unit:** 744-358

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 2.0 Spruce 0.0 Mixed Hem/Spr 4.1 **Nonforested** 0.0 **Aspect:** SW
Volume class breakdown: Class 4: 0.0 Class 5: 0.0 Class 6: 6.1 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 6.1 Not Seen 0.0 **VQOs:** PR- 1.9 MM- 0.0 M- 4.2 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 5.2 **Low VAC** 0.9 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.2 Class 3 Stream: 0.1 Soils: 0.0
Mass movement Index: Low 0.0 Medium 3.1 High 3.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 0.0 4- 6.1
High Value Habitat: Sitka Black-Tail Deer- 4.5 Marten- 6.1 River Otter- 1.6 Bald Eagle- 0.7 Black Bear- 6.1
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit consists of high landslide potential soils, MMI=3 (BMP 13.5). Recommend at least partial log suspension when yarded (BMP 13.9). NRB 8/30/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7) Pink/Chum timing (June 1 - August 7) may apply for all road construction and/or drainage installation (BMP14.6).

Fish/Watershed Input
Class II HC3 stream south (TTRA): 100 foot no cut buffer (BMP 12.6 and 12.6a).

Wildlife Input
Harvest operations restricted to April 1 to October 31 to protect trumpeter swan resting/feeding areas.

Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 8/30/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

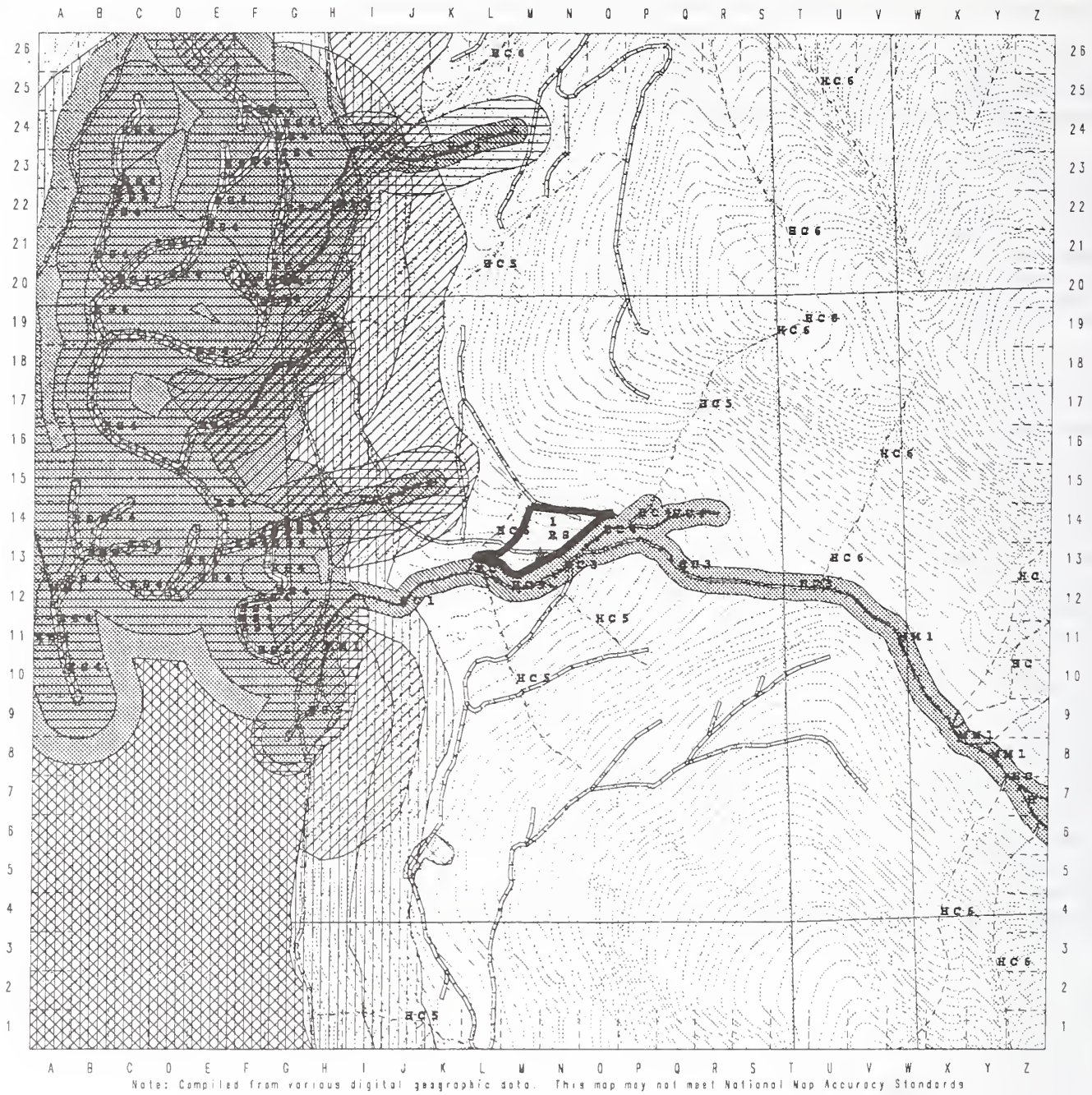
Geological Input
No concerns. NRB 8/30/95

Silviculture Input
Moderate productivity with small areas of Hydric soils that will need to be planted. (3 acres) CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 40

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Roadrmouse 333 ft. Buffer
Body of Water
Prior Harvest
Updates to Matleods

Vole 4 - 0
Vole 5 - 0
Vole 6 - 6
Vole 7 - 0
Total Acres - 6
Potential MBF - 275
Quarter Quad - KTNCSNE
VCU Number - 744
Photo Number - 1873-160
Alternative Pattern - 30560
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - State zone

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 41 **Planned Acres:** 12.3 **Estimated Volume:** 555.5 **In Alternatives:** 2 , 3 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 3 **Quad:** KTNC5NE **Photo:** 1673-160 **Logging systems:** - RS- HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D71A **WAA Number:** 510 **NOI Unit:** 359 **Original LSTA Unit:** 744-359

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 12.3 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** SW
Volume class breakdown: Class 4: 0.0 Class 5: 0.0 Class 6: 12.3 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 12.4 Not Seen 0.0 **VQOs:** PR- 10.3 MM- 0.0 M- 2.1 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 8.5 **Low VAC** 3.8 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 3.5 Soils: 0.0
Mass movement Index: Low 0.0 Medium 0.0 High 11.9 Very High 0.5 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 0.0 4- 12.3
High Value Habitat: Sitka Black-Tail Deer- 10.9 Marten- 12.0 River Otter- 1.2 Bald Eagle- 0.0 Black Bear- 12.0
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
The east central part of this unit is made up of a small area, about 2 acres, of very high landslide potential soils, MMI=4 (BMP 13.5). Recommend dropping this part of the unit. Much of the rest of the unit has a high potential for landslides, MMI=3. Recommend at least partial log suspension during yarding to minimize soil disturbance (BMP 13.9). Road construction through this unit will require some full bench construction, with end haul and disposal of overburden (BMPs 14.7, 14.12). Recommend disposal area to the south, above the next road junction.

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Northeastern portion of planned unit may become a blind lead depending on final road location. Verify feasibility of providing suspension requirements (see soils input) in relation to final road location and modify unit boundary as required.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. Oversteepened slopes may require full bench construction and endhaul of waste material. (BMP 14.7)
Pink/Chum timing (June 1 - August 7) may apply for all road construction and/or drainage installations (BMP 14.6).

Fish/Watershed Input
Class III HC5 stream east: split yarding and full suspension required (BMP 13.16).

Wildlife Input
Harvest operations restricted to April 1 to October 31 to protect trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit may be seen from Carroll estuary. Identified VQO is partial retention. WEA 9/30/95

Lands Input
No concerns. NRB 8/29/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

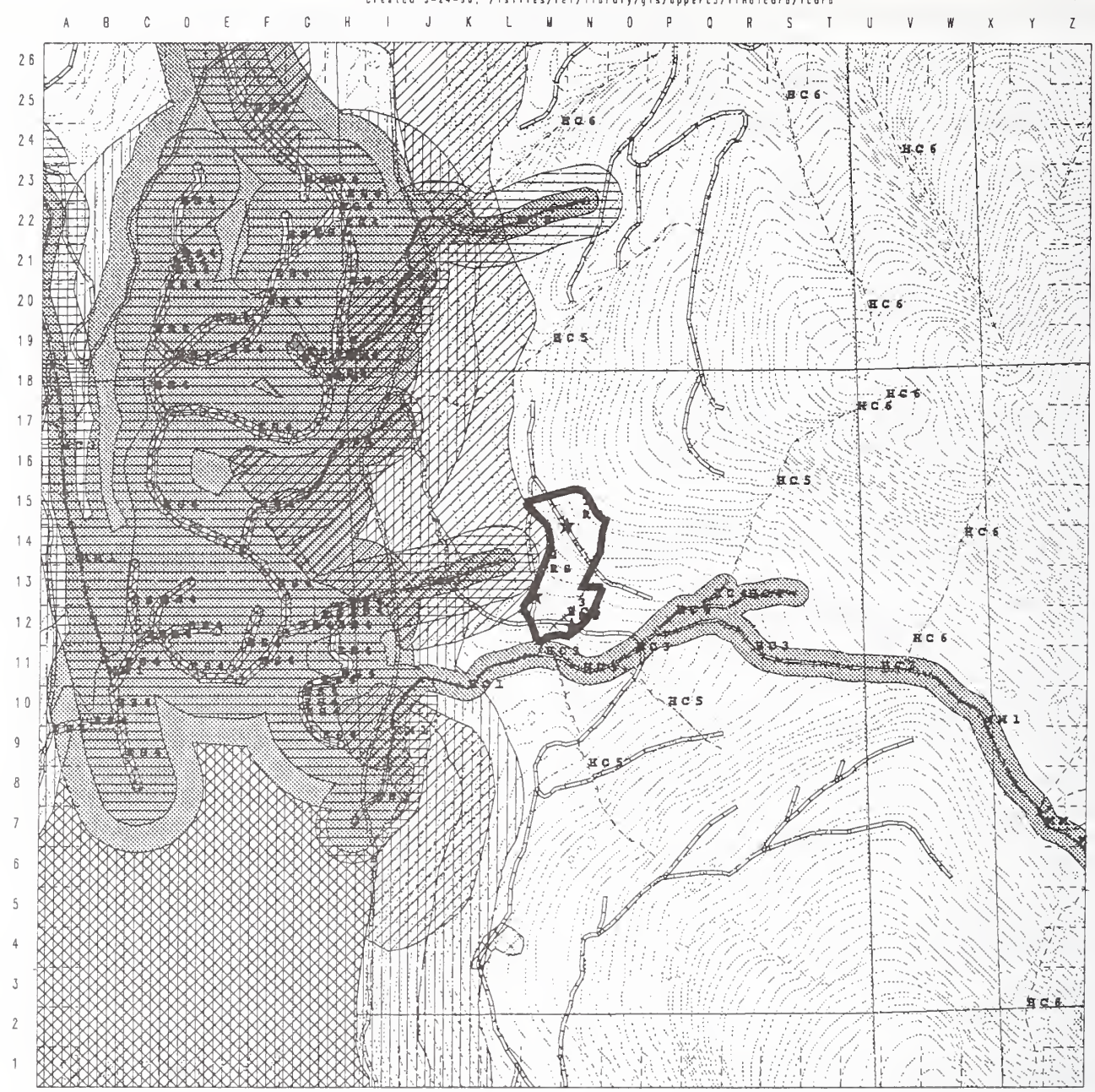
Geological Input
No concerns. NRB 8/29/95

Silviculture Input
Highly productive with small areas of high mass movement soils. Planting will be required, using Alaska yellow cedar if available. (3 acres) . Consider shelterwood system to alleviate soil concerns. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 41

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fstiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Volc 4 - 0
Volc 5 - 0
Volc 6 - 12
Volc 7 - 0
Total Acres - 12
Potential WBF - 556
Quarter Quad - K1NC5NE
VCU Number - 744
Photo Number - 1673-160
Alternative Pattern - 230560
★ Landing

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet
0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 43 **Planned Acres:** 21.2 **Estimated Volume:** 955.0 **In Alternatives:** 0 , 3 , 0 , 0 , 7
Silvicultural System : See section **Number of Settings:** 2 **Quad:** KTNC5NE **Photo:** 1673-161 **Logging systems:** - RS- HE- SL
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 362 **Original LSTA Unit:** 744-362

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 21.2 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** W
Volume class breakdown: Class 4: 0.0 Class 5: 0.0 Class 6: 21.2 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 21.2 Not Seen 0.0 **VQOs:** PR- 6.7 MM- 0.0 M- 14.5 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 15.2 **Low VAC** 6.0 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 6.3 Soils: 0.0
Mass movement Index: Low 0.0 Medium 6.9 High 14.3 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 0.0 4- 21.2
High Value Habitat: Sitka Black-Tail Deer- 3.7 Marten- 3.7 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 18.9
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit contains soils that have a high potential for landslides (BMP 13.5). Recommend at least partial suspension when yarding (BMP 13.9). Roads on these soils may require full-bench constrcution (BMP 14.7). Over burden should be end-hauled and disposed of near the south end of Harvest Unit 359 (BMP 14.12). NRB 8/29/95

Timber Input
Planned logging systems design for this unit is Running Skyline and Slackline. Confirm final road and landing locations. Eastern portion of planned unit appears to be a blindlead. Upper road/landings maybe needed to yard. Full suspension is required across Class III stream in Western portion of unit. Verify feasibility and modify unit boundary as required.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. Oversteepened slopes may require full bench construction and endhaul of waste. (BMP 14.7)

Fish/Watershed Input
Class III HC5 stream north: split yarding or full suspension required (BMP 13.16). Due to stream location and incision, a sideslope buffer may be implemented during harvest unit layout (BMP 12.6).

Wildlife Input
Harvest operations restricted to April 1 to October 31 to protect trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit may be seen from Carroll estuary. Identified VQO is modification. WEA 9/30/95

Lands Input
No concerns. NRB 8/29/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

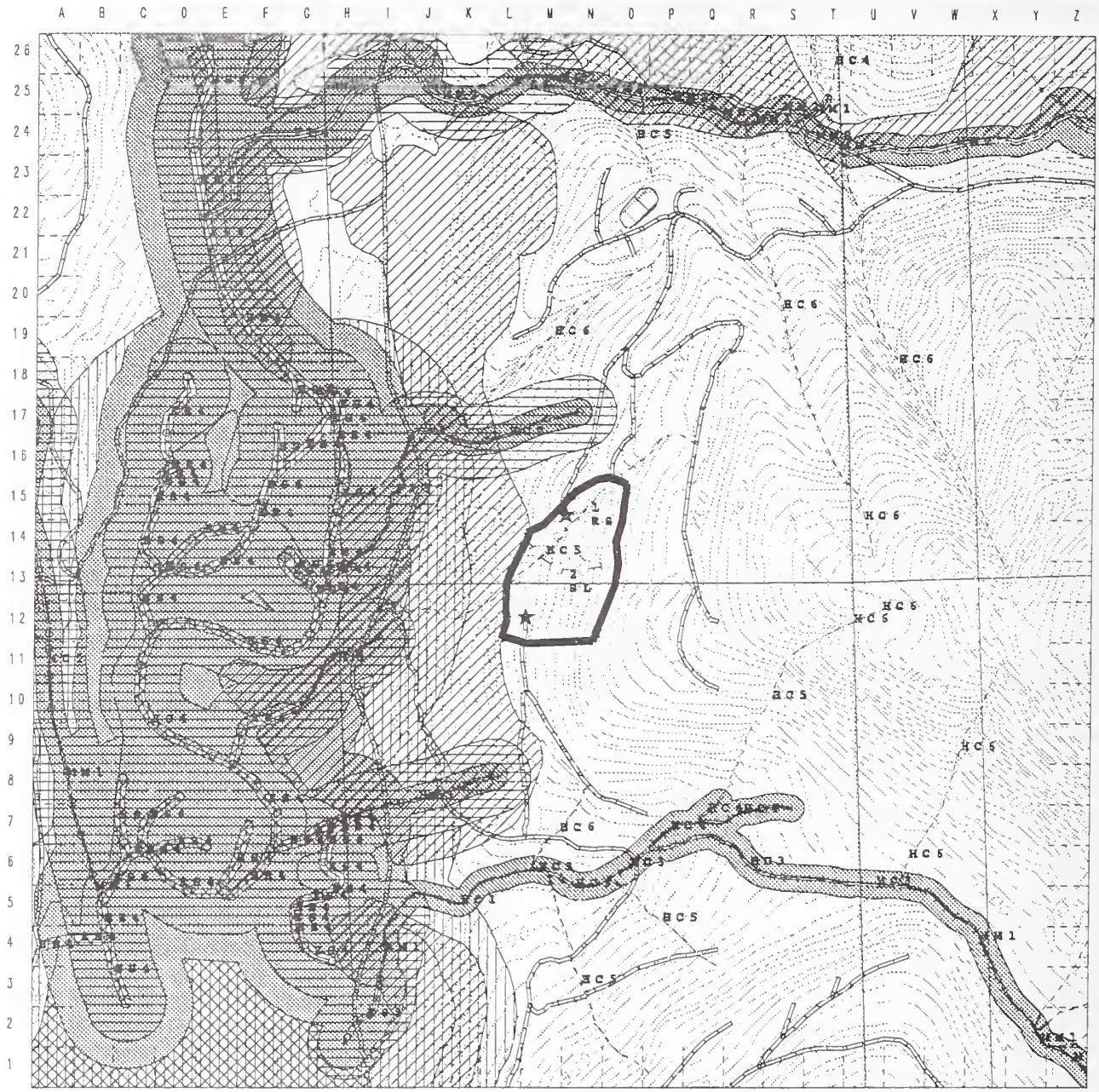
Geological Input
Unit contains several V-notches or incised drainages. Recommend that yarding be split on these V-notches and that any trees within the V-notch be retained (BMP 13.16). NRB 8/29/95

Silviculture Input
Highly productive with small areas of high elevation and high mass movement soils. Plant using Alaska yellow cedar if available. (3 acres) CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 43

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /istiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vols 4 - 0
Vols 5 - 0
Vols 6 - 21
Vols 7 - 0
Total Acres - 21
Potential MBF - 955
Quarter Quad - KINC5NE
VCU Number - 744
Photo Number - 1673-161
Alternative Pattern - 3007
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 47 **Planned Acres:** 25.2 **Estimated Volume:** 1,134.8 **In Alternatives:** 2 , 3 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 3 **Quad:** KTNC5NE **Photo:** 1673-161 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 366 **Original LSTA Unit:** 744-366

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 25.2 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** NW
Volume class breakdown: Class 4: 0.0 Class 5: 0.0 Class 6: 25.2 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 25.1 Not Seen 0.0 VQOs: PR- 0.0 MM- 0.0 M- 25.1 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 25.2 **Low VAC** 0.0 **Roadless** 3.8
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 2.5 Soils: 0.0
Mass movement Index: Low 0.0 Medium 23.3 High 1.9 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 0.7 4- 24.5
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 25.2
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
The north end of the unit (N-15) contains some high landslide potential soils, MMI=3 (BMP 13.5). Recommend at least partial log suspension when yarding (BMP 13.9). NRB 8/30/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. Oversteepened slopes may require full bench construction and endhaul of waste. (BMP 14.7)

Fish/Watershed Input
Class III HC6 stream southern reach: 100 foot sideslope buffer (BMP 12.6)
Class III HC6 stream northern reach: split yarding or full suspension required (BMP 13.16, 13.9)

Wildlife Input
Due to its proximity to the LTF, this unit has the same swan timing constraints as the LTF. Harvest operations prohibited from December 1 to January 31 to protect trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit may be seen Carroll Inlet. Identified VQO is modification. Uncut timber will help to screen unit WEA 9/30/95

Lands Input
No concerns. NRB 8/30/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

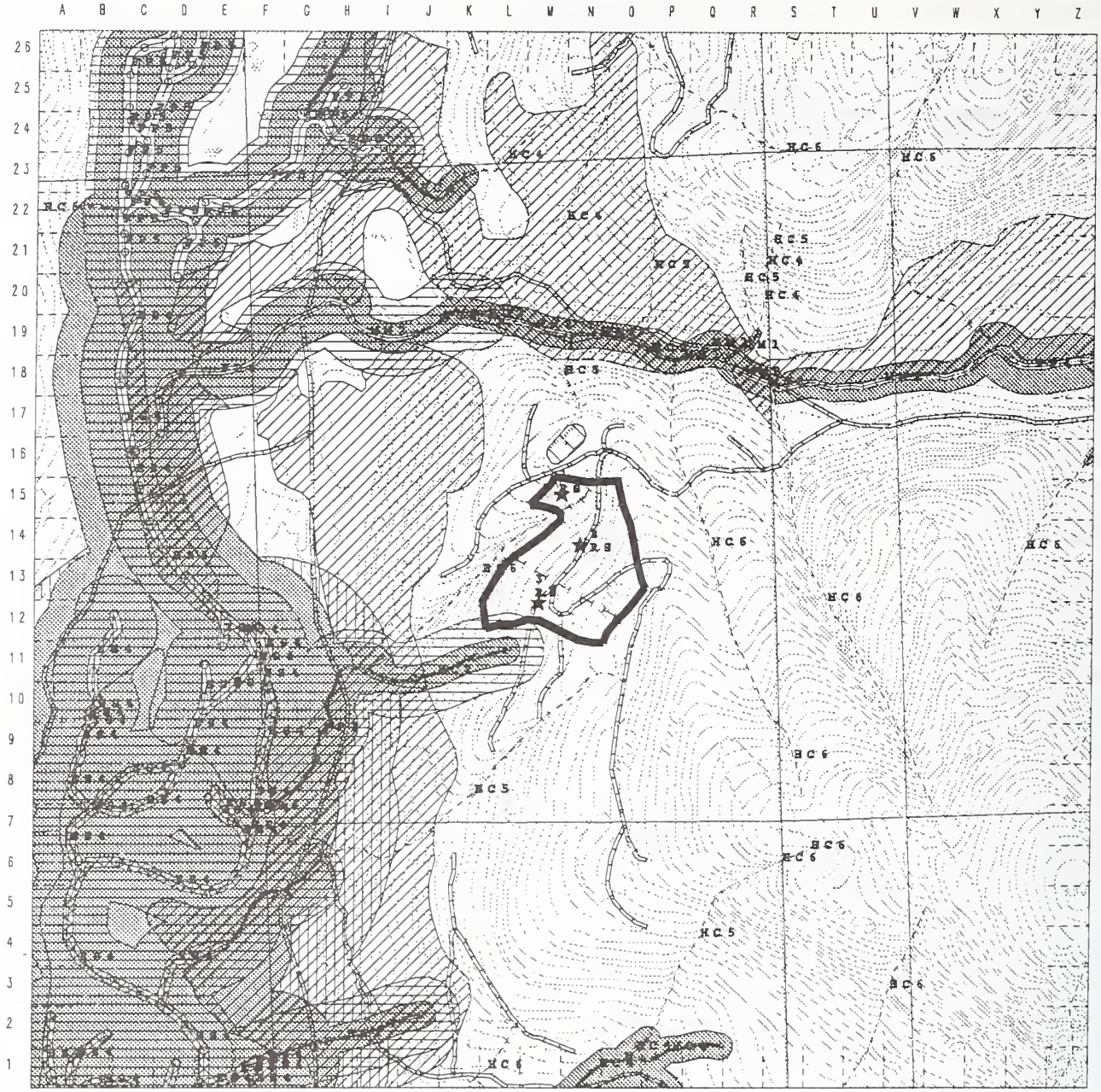
Geological Input
V-notch along the nw side of this unit (M-14 to J-12). Recommend retaining a wind-firm buffer along the edge of this V-notch (BMP 12.6a and 13.16). NRB 8/30/95

Silviculture Input
Highly productive with small areas of high elevation and high mass movement soils. Planting will be required, using Alaska yellow cedar if available. (3 acres) CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 47

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-98, /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Roadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Matlsods

Volc 4 - 0
Volc 5 - 0
Volc 6 - 25
Volc 7 - 0
Total Acres - 25
Potential MBF - 1135
Quarter Quad - KINGSME
VCU Number - 744
Photo Number - 1673-161
Alternative Pattern - 230560
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 48 **Planned Acres:** 11.7 **Estimated Volume:** 527.8 **In Alternatives:** 2 , 0 , 0 , 0 , 0
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC5NE **Photo:** 1890-2 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 367 **Original LSTA Unit:** 744-367

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 11.7 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** SW
Volume class breakdown: Class 4: 0.0 Class 5: 0.0 Class 6: 11.7 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 11.8 Not Seen 0.0 **VQOs:** PR- 1.9 MM- 0.0 M- 9.9 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 9.0 **Low VAC** 2.7 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 1.2 Soils: 0.0
Mass movement Index: Low 0.0 Medium 11.7 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 8.4 4- 3.4
High Value Habitat: Sitka Black-Tail Deer- 7.3 Marten- 7.3 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 9.0
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
No concerns. NRB 8/30/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Southern portion of planned unit appears to be a blindlead. Verify feasibility and modify unit boundary as required.

Engineering Input
Oversteepened slopes may require full bench construction and endhaul of waste. (BMP 14.7)

Fish/Watershed Input
Class III HC6 stream east: sideslope buffer (12.6).

Wildlife Input
Harvest operations restricted to April 1 to October 31 to protect trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit located on lower slope. May be seen from Carroll Inlet. Identified VQO is modification. Beach and estuary buffer will help mollify visual impact. WEA 9/30/95

Lands Input
No concerns. NRB 8/30/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

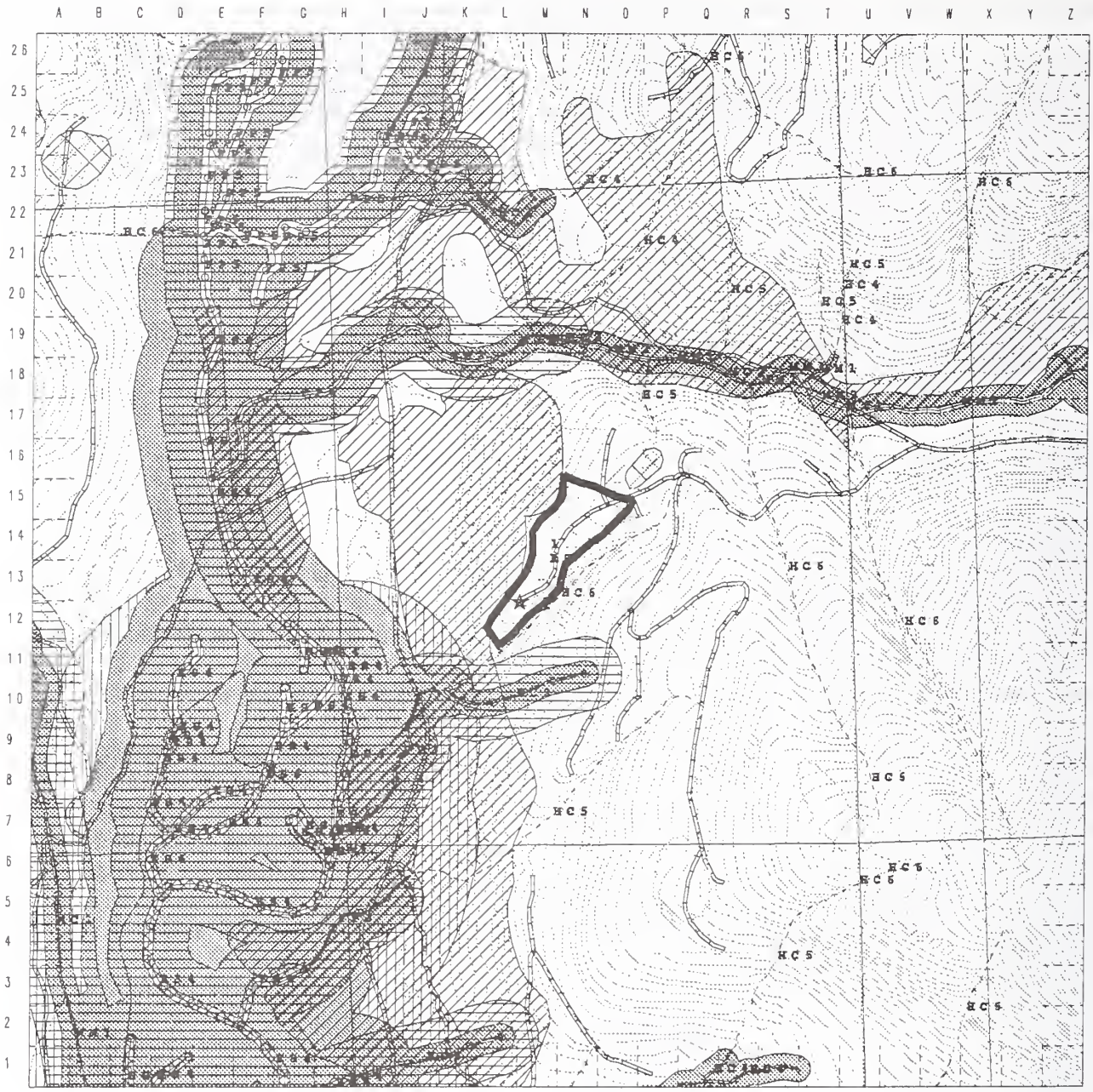
Geological Input
V-notch along the south unit boundary (N-14 to J-11). Recommend wind-firm slope break buffer along this V-notch (BMP 13.16). NRB 8/30/95

Silviculture Input
Moderate productivity with good natural regeneration. No concerns. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 48

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-98, /fstiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vols 4 - 0
Vols 5 - 0
Vols 6 - 12
Vols 7 - 0
Total Acres - 12
Potential MBF - 528
Quarter Quad - ATNC5NE
VCU Number - 744
Photo Number - 1890-2
Alternative Pattern - 20000
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 49 **Planned Acres:** 45.7 **Estimated Volume:** 2,041.9 **In Alternatives:** 2 , 3 , 5 , 6 , 7
Silvicultural System : See section **Number of Settings:** 4 **Quad:** KTNC5NE **Photo:** 1673-161 **Logging systems:** - RS- HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 368 **Original LSTA Unit:** 744-368

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 43.8 Spruce 0.0 Mixed Hem/Spr 1.9 **Nonforested** 0.0 **Aspect:** N
Volume class breakdown: Class 4: 0.0 Class 5: 1.9 Class 6: 43.8 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 14.2 Not Seen 31.5 **VQOs:** PR- 0.0 MM- 31.5 M- 14.2 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 31.8 **Intermediate VAC** 13.9 **Low VAC** 0.0 **Roadless** 2.7
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 5.7 Soils: 0.0
Mass movement Index: Low 0.0 Medium 36.3 High 9.0 Very High 0.5 Unknown 0.0 **Slopes Greater Than 72%** 0.9
Wetland Information: Wetland 1.4 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 12.9 4- 32.8
High Value Habitat: Sitka Black-Tail Deer- 0.7 Marten- 17.3 River Otter- 6.7 Bald Eagle- 0.0 Black Bear- 43.6
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
North side of unit (J-16 to Q-15) consists of an extremely steep and potentially unstable, MMI=4, stream gorge which should not be included in the proposed harvest unit . Recommend that the lower unit boundary be located at the top of this slope break (BMP 13.5). East (P-14) and west (J-16) ends of this unit contain high landslide potential soils (BMP 13.5) Recommend at least partial log suspension when yarded (BMP 13.9). Small area, 2 to 3 acres of forested wetland and open muskeg is located in the east central (L-15) part of the unit (BMP 12.5). This area is suitable for shovel logging (BMP 13.9). NRB 8/30/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Northern portion of planned unit is adjacent to a Class I/II stream with associated gorge. Determine feasibility of tying across TTRA buffer (need Stream Protection Plan) to include some or all of area adjacent to gorge. Modify unit boundary as required.

Engineering Input
High MMI soils. Road constuction must minimize landslide potential. Oversteepened slopes may require full bench construction and endhaul of waste. (BMP 14.7) Coho/Pink/Chum timing (June 1 - August 15) may apply for all road construction and/or drainage installations (BMP 14.6).

Fish/Watershed Input
Class I MM1/MM2 stream north (TTRA): 300 foot buffer (BMP 12.6a).
Class III HC5 stream west: split yarding or full suspension required (BMP 12.6a, 13.16)
Class III HC6 stream east: split yarding or full suspension required (BMP 12.6a, 13.16)
Class III HC5 stream east (borders unit): sideslope buffer (BMP 12.6a).

Wildlife Input
Snag distribution concernes were adressed between the Draft and Final EIS. Snag Patches were left along the northern boundary and in the stream buffer. Leave islands are compatible with logging systems and safe working conditions.

Recreation / Visuals Input
Small portion of unit can be seen from Carroll estuary. Identified VQO is maximum modification. Adjacent uncut timber will help screen unit. WEA 9/30/95

Lands Input
No concerns. NRB 8/30/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
V-notch located in the east part (P-13 to O-15) of this unit. Recommend a wind-firm slope break buffer be maintained on this V-notch (BMP 13.16). NRB 8/30/95

Silviculture Input
Highly productive with small areas of high elevation and high mass movement soils. Plant using Alaska yellow cedar if available. (10 acres) CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 49

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Volc 4 - 0
Volc 5 - 2
Volc 6 - 44
Volc 7 - 0
Total Acres - 46
Potential MBF - 2042
Quarter Quad - KINGSNE
VCU Number - 744
Photo Number - 1673-161
Alternative Pattern - 230567

★ Landing

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 51 **Planned Acres:** 23.0 **Estimated Volume:** 771.7 **In Alternatives:** 2 , 3 , 0 , 0 , 7
Silvicultural System : See section **Number of Settings:** 3 **Quad:** KTNC5NE **Photo:** 1890-48 **Logging systems:** - RS- HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 371 **Original LSTA Unit:** 744-371

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 14.8 Spruce 0.0 Mixed Hem/Spr 7.3 **Nonforested** 0.0 **Aspect:** W
Volume class breakdown: Class 4: 0.0 Class 5: 22.1 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.9
Visuals: Seen 23.0 Not Seen 0.0 **VQOs:** PR- 0.0 MM- 0.0 M- 23.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 23.0 **Low VAC** 0.0 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 5.4 Soils: 0.0
Mass movement Index: Low 9.5 Medium 0.0 High 13.5 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.7 2- 0.0 3- 1.6 4- 20.7
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 22.0
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Much of the unit includes extremely steep, shallow, potentially unstable soils, MMI=4, that are physically unsuited for commercial forest production (BMP 13.5). Recommend that this unit be dropped from consideration in any alternatives (BMP 13.1). NRB 8/30/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Southern portion of planned unit appears to be a blindlead. Verify feasibility and modify unit boundary as required.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. Oversteepened slopes may require full bench construction and endhaul of waste. (BMP 14.7)

Fish/Watershed Input
Class III HC5 stream south: sideslope buffer or exclusion from unit (BMP 12.6, 12.6a).
Class III HC4 stream central: split yarding or full suspension required (BMP 13.16)

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
Unit may be seen from Carroll estuary. Identified VQO is modification. WEA 9/30/95

Lands Input
No concerns. NRB 8/30/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
Very high landslide potential, MMI=4. See Soils Input. NRB 8/30/95

Silviculture Input
Highly productive with areas of high elevation and high mass movement soils. Regeneration of much of unit will be difficult due to steep, shallow soils. Recommend application of shelterwood system leaving all trees 13" DBH and under standing. If clearcut unit will require planting. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 51

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-98, /isfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vols 4 - 0
Vols 5 - 22
Vols 6 - 0
Vols 7 - 0
Total Acres - 23
Potential MBF - 772
Quarter Quad - KINCSNE
VCU Number - 744
Photo Number - 1890-48
Alternative Pattern - 23007

★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 52 **Planned Acres:** 48.0 **Estimated Volume:** 1,694.3 **In Alternatives:** 2 , 0 , 0 , 0 , 0
Silvicultural System : See section **Number of Settings:** 4 **Quad:** KTNC5NE **Photo:** 1890-48 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 372 **Original LSTA Unit:** 744-372

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 24.3 Spruce 0.0 Mixed Hem/Spr 22.7 **Nonforested** 0.0 **Aspect:** W
Volume class breakdown: Class 4: 0.0 Class 5: 41.2 Class 6: 5.9 Class 7: 0.0 **Low Productive** 0.9
Visuals: Seen 48.0 Not Seen 0.0 **VQOs:** PR- 0.0 MM- 0.0 M- 48.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 48.0 **Low VAC** 0.0 **Roadless** 15.9
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 9.3 Soils: 0.0
Mass movement Index: Low 22.2 Medium 14.5 High 11.3 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 8.3 Mix Wetland 0.0 Riparian Soil 0.1 **Site Productivity Classes** 1- 3.0 2- 6.0 3- 19.2 4- 25.7
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 40.6
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit includes forested wetlands (BMP 12.5). Recommend at least partial log suspension when yarded (BMP 13.9).

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Northeastern portion of planned unit appears to be a blindlead. Verify feasibility and modify unit boundary as required.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7)

Fish/Watershed Input
- Class III HC6 stream northeast: split yarding and full suspension required (BMP 13.9).
- Class III HC5 stream north: sideslope buffer required (BMP 12.6).

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
Unit may be seen from Carroll estuary. Identified VQO is modification. Adjacent uncut timber will help to screen unit. WEA 9/30/95

Lands Input
No concerns. NRB 8/30/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

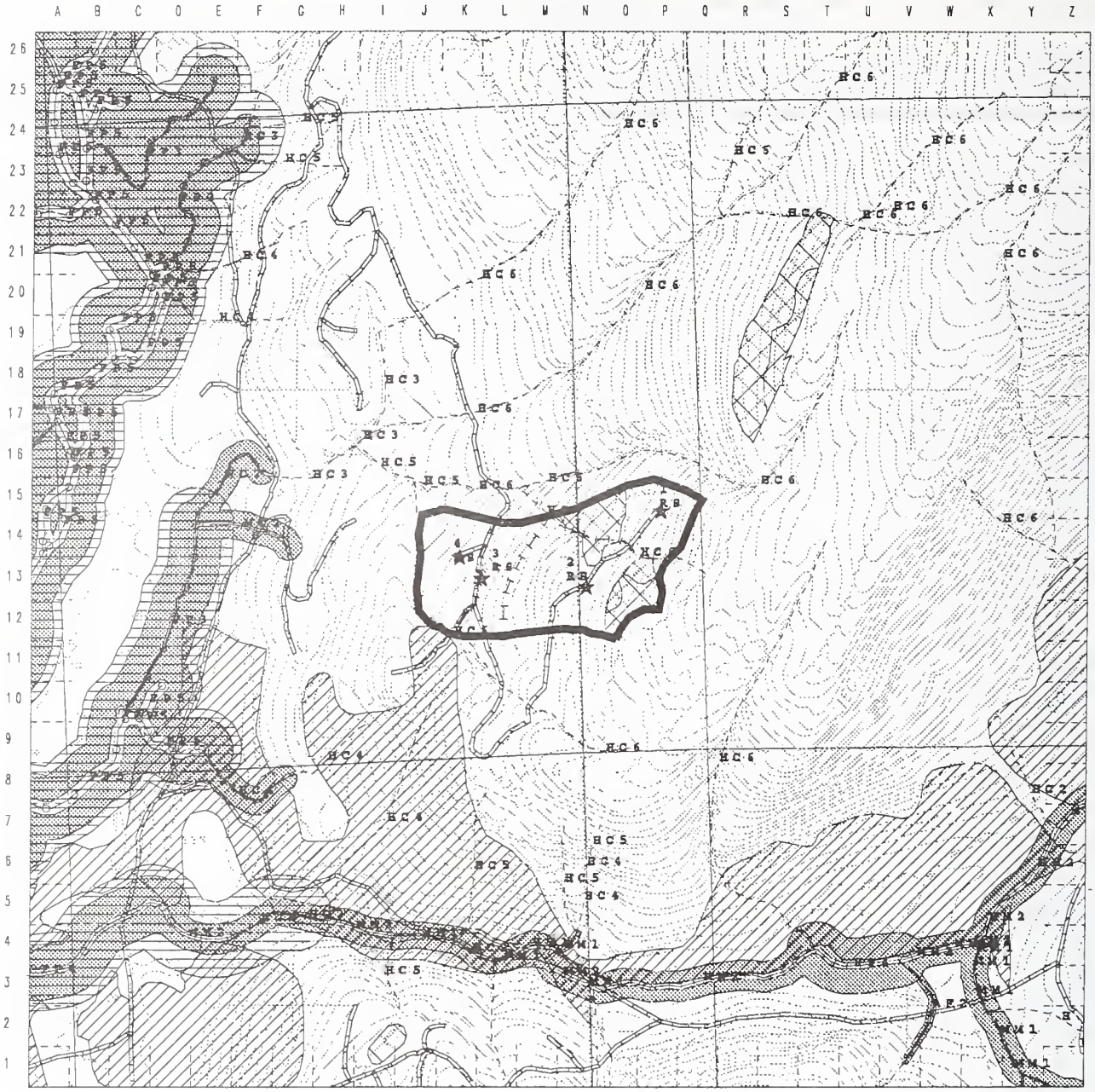
Geological Input
V-notch located along north unit boundary (J-15 to Q-15). Recommend wind-firm slope break buffer be retained to protect this V-notch (BMPs 12.6a, 13.16). A road across this V-notch will require some full-bench construction and end-haul of overburden (BMPs 14.7, 14.12). NRB 8/30/95

Silviculture Input
Moderately productive with small areas of high elevation and high mass movement soils. Planting will be required, using Alaska yellow cedar if available. (5 acres) CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 52

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96. /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vole 4 - 0
Vole 5 - 41
Vole 6 - 6
Vole 7 - 0
Total Acres - 48
Potential MBF - 1694
Quarter Quad - KTNC5NE
VCU Number - 744
Photo Number - 1890-48
Alternative Pattern - 20000
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 53 **Planned Acres:** 33.4 **Estimated Volume:** 764.0 **In Alternatives:** 2 , 0 , 0 , 0 , 0
Silvicultural System : See section **Number of Settings:** 3 **Quad:** KTNC4NW **Photo:** 1890-47 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 375 **Original LSTA Unit:** 744-375

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 24.9 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** W
Volume class breakdown: Class 4: 24.4 Class 5: 0.5 Class 6: 0.0 Class 7: 0.0 **Low Productive** 8.5
Visuals: Seen 5.3 Not Seen 28.1 **VQOs:** PR- 0.0 MM- 28.1 M- 5.3 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** SPNM **High VAC** 0.0 **Intermediate VAC** 33.4 **Low VAC** 0.0 **Roadless** 33.4
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 17.2 Medium 0.0 High 13.1 Very High 3.2 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 10.9 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 33.4 2- 0.0 3- 0.0 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 0.0
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit consists sub-alpine ecosystem, mountain hemlock plant series, low-productivity sites. Regeneration may be damaged by heavy snowpack. South part of unit (M-12, M-13) is made up of high landslide potential soils (BMP 13.5). Recommend at least partial log suspension on this setting (BMP 13.9). Central part of unit (M-14) includes wetland (BMP 12.5). Recommend at least partial log suspension when yarding this setting (BMP 13.9). North end of unit (O-17) includes very high landslide potential soils, MMI=4. Recommend that the north part of this setting be dropped from Harvest Unit 53 (BMP 13.5). NRB 8/31/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations.

Engineering Input
High MMI soils. Road constructon must minimize landslide potential. (BMP 14.7)

Fish/Watershed Input
No fisheries concerns

Wildlife Input
Maintain distribution of snags by leaving 1-5 acre-sized islands of green trees at a rate of 1 acre of island for every 20 acres harvested. Leave islands must be compatible with logging systems and safe working conditions.

Recreation / Visuals Input
Unit may be seen from Carroll Inlet. Identified VQO is modification. Adjacent uncut standing timber will help screen unit. WEA 9/30/95

Lands Input
No concerns. NRB 8/31/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
No concerns. NRB 8/31/95

Silviculture Input
Low productivity with areas of high elevation and high mass movement soils. Planting will be required, using Alaska yellow cedar and high elevation sitka Spruce. (6 acres) CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 53

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96. /tsfiles/ref/library/gis/upperC5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Roadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vole 4 - 24
Vole 5 - 1
Vole 6 - 0
Vole 7 - 0
Total Acres - 33
Potential MBF - 764
Quarter Quad - K1NC4NW
VCU Number - 744
Plots Number - 1890-47
Alternative Pattern - 20000
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateprane

Feet
0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 55 **Planned Acres:** 9.6 **Estimated Volume:** 332.7 **In Alternatives:** 2 , 3 , 5 , 6 , 7
Silvicultural System : See section **Number of Settings:** 2 **Quad:** KTNC5NE **Photo:** 1573-162 **Logging systems:** - RS- HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 378 **Original LSTA Unit:** 744-378

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 0.0 Spruce 0.0 Mixed Hem/Spr 9.6 **Nonforested** 0.0 **Aspect:** W
Volume class breakdown: Class 4: 0.0 Class 5: 9.6 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 2.9 Not Seen 6.7 **VQOs:** PR- 0.0 MM- 6.7 M- 2.9 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 7.1 **Intermediate VAC** 2.5 **Low VAC** 0.0 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.1 Class 2 Stream: 0.1 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 0.0 Medium 9.6 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.1 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1 0.0 2- 0.0 3- 5.8 4- 3.9
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 9.5 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 9.6
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
No concerns. NRB 8/31/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations.

Engineering Input
Steelhead/Coho/Pink/Chum timing (July 18 - August 7) may apply for all road construction and/or drainage installations (BMP 14.6).

Fish/Watershed Input
Class II MC2 stream north (TTRA): 100 foot no cut buffer (BMP 12.6 and 12.6a)
Class I FP3 stream west (TTRA): 200 foot no cut buffer (BMP 12.6 and 12.6a)

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
Portion of unit may be seen from Carroll Inlet. Identified VQO is maximum modification. Unit is located low on the the slope and stream buffers will help to screen unit.

Lands Input
No concerns. NRB 8/31/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

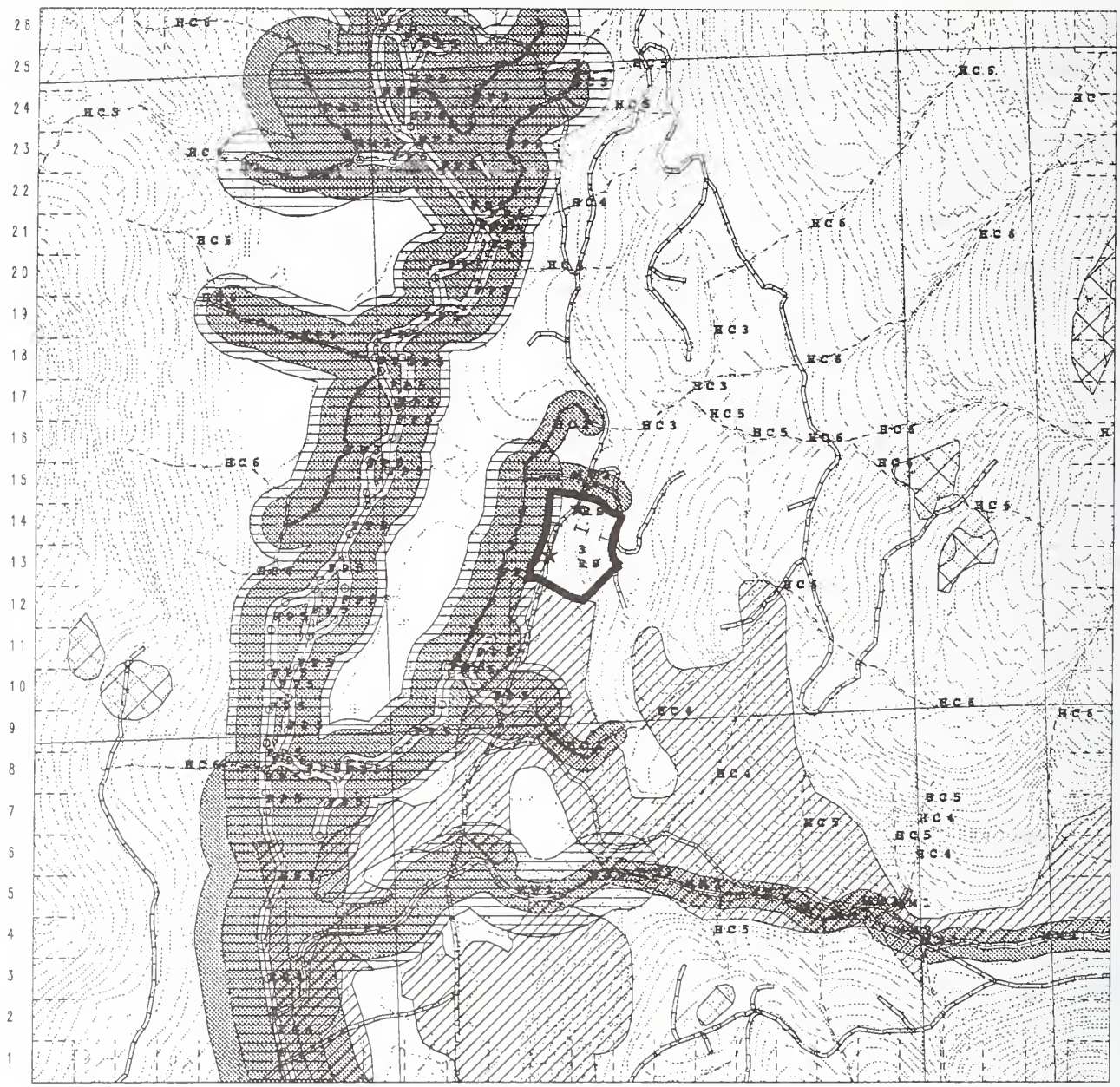
Geological Input
No concerns. NRB 8/31/95

Silviculture Input
Highly productive with small areas of Hydric soils that will need to be planted. (6 acres) Setting 1 contains a partial cut stream buffer. Prescription will need to identify tree marking guides. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 55

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /tsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vols 4 - 0
Vols 5 - 10
Vols 6 - 0
Vols 7 - 0
Total Acres - 10
Potential MBF - 333
Quarter Quad - KTNCSNE
VCU Number - 744
Photo Number - 1573-162
Alternative Pattern - 230567
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Feet

0 526 1056 1582 2112

Projection - Stateplane

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 57 **Planned Acres:** 30.4 **Estimated Volume:** 1,040.3 **In Alternatives:** 2 , 3 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 4 **Quad:** KTNC5NE **Photo:** 1890-5 **Logging systems:** - RS- LS- SH
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 382 **Original LSTA Unit:** 744-382

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 1.2 Spruce 0.0 Mixed Hem/Spr 29.2 **Nonforested** 0.0 **Aspect:** SE
Volume class breakdown: Class 4: 1.2 Class 5: 29.2 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 0.0 Not Seen 30.4 **VQOs:** PR- 0.0 MM- 30.4 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** SPNM **High VAC** 30.4 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 30.4
Riparian MA: Class 1 Stream: 0.1 Class 2 Stream: 0.0 Class 3 Stream: 2.2 Soils: 0.0
Mass movement Index: Low 6.7 Medium 22.4 High 1.3 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 1.3 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 1.3 4- 29.0
High Value Habitat: Sitka Black-Tail Deer- 0.9 Marten- 28.2 River Otter- 3.2 Bald Eagle- 2.4 Black Bear- 29.4
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
No concerns. NRB 8/31/95

Timber Input
Planned logging systems design for this unit is Running Skyline, Shovel, and Live Skyline. Confirm final road and landing locations. Setting #5 is primarily within a selective harvest buffer. ITM setting #5 and shovel yard or adjust unit boundary to exclude.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. Oversteepened slopes may require full bench construction and endhaul of waste. (BMP 14.7) Steelhead/Coho/Pink/Chum timing (July 18 - August 7) may apply for all road construction and/or drainage installations.

Fish/Watershed Input
Class II LC2 stream west (TTRA): sideslope plus 100 foot extended buffer (BMP 12.6 and 12.6a)
Class I FP3 stream south (TTRA): 260 foot buffer (BMP 12.6 and 12.6a)
Class III HC5 streams west-central : split yarding or full suspension required (BMP 13.9)
Class III HC6 stream southeast: sideslope buffer (BMP 12.6 and 12.6a)

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/28/95

Lands Input
No concerns. NRB 8/31/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

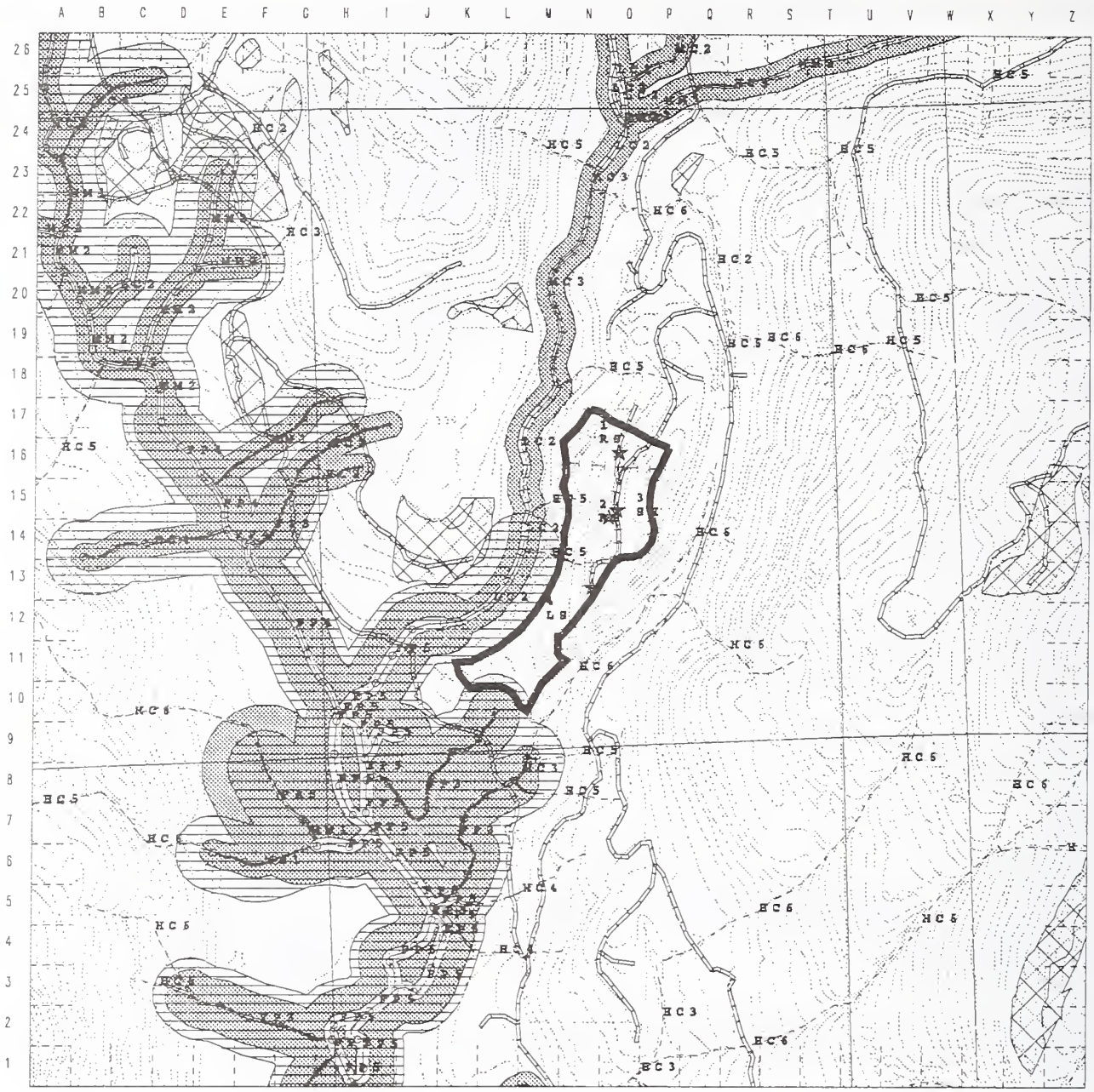
Geological Input
No concerns. 8/31/95

Silviculture Input
Moderate productivity with good natural regeneration. Small pockets of hemlock dwarf mistletoe and Alaska yellow cedar decline should be included within harvest unit. Monitor for re-occurence following harvest. Prescription should address partial cut stream buffer. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 57

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /tsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Flooding Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 150 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Vols 4 - 1
Vols 5 - 29
Vols 6 - 0
Vols 7 - 0
Total Acres - 30
Potential MBF - 1040
Quarter Quad - KINC5NE
VCU Number - 744
Photo Number - 1890-5
Alternative Pattern - 230560

★ Landing

Projection - Stateplane

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 58 **Planned Acres:** 17.7 **Estimated Volume:** 498.5 **In Alternatives:** 0 , 3 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 2 **Quad:** KTNC5NE **Photo:** 1890-45 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 384 **Original LSTA Unit:** 744-384

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 9.3 Spruce 0.0 Mixed Hem/Spr 6.5 **Nonforested** 0.0 **Aspect:** W
Volume class breakdown: Class 4: 9.3 Class 5: 6.5 Class 6: 0.0 Class 7: 0.0 **Low Productive** 1.8
Visuals: Seen 12.5 Not Seen 5.2 **VQOs:** PR- 0.0 MM- 5.2 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** SPNM **High VAC** 10.1 **Intermediate VAC** 6.9 **Low VAC** 0.6 **Roadless** 17.7
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 3.3 Soils: 13.5
Mass movement Index: Low 1.9 Medium 9.5 High 6.2 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 1.9 3- 0.0 4- 15.8
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 13.1
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
This unit contains high landslide potential soils (BMP 13.5). Recommend that at least partial log suspension be achieved to minimize soil disturbance (BMP 13.9). The western edge of this unit (M-12 to M-14) is on the other side of the ridge from the proposed road and will result in a blind lead. Recommend that this area be dropped from this unit and included with Harvest Unit 385 (BMP 13.2). NRB 8/31/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Modify Western unit boundary if location is different than ridge top.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7)

Fish/Watershed Input
Class I MM1/MC2 stream south (TTRA): 120 foot buffer or slopebreak buffer which ever is greater (BMP 12.6, 12.6a).
Class III HC6 stream north: sideslope buffer(BMP 12.6, 12.6a).

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 8/31/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

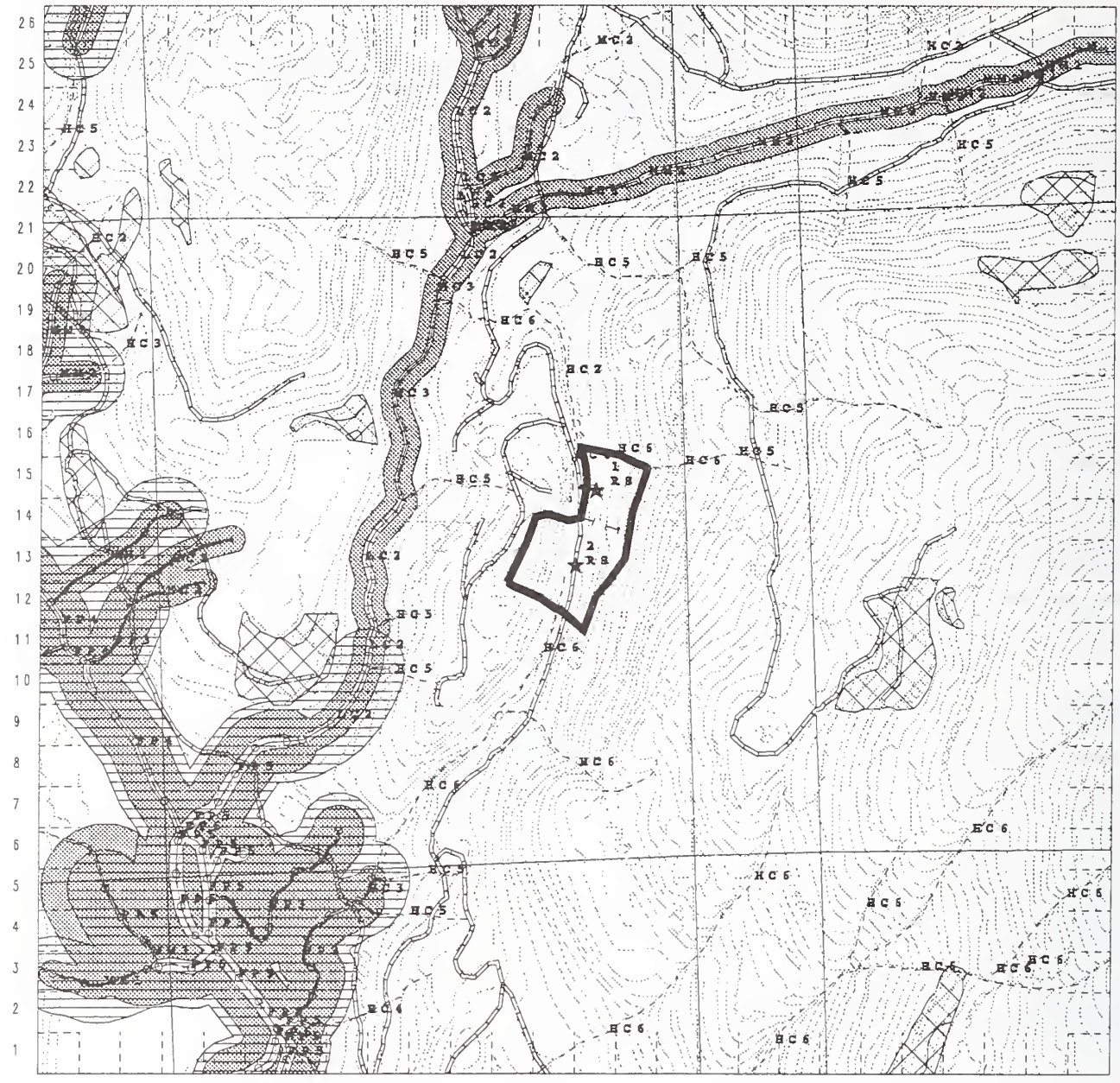
Geological Input
No concerns. NRB 8/31/95

Silviculture Input
Moderate productivity with areas of landlslide potential. Plant 3 acres. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 58

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-98, /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vole 4 - 9
Vole 5 - 7
Vole 6 - 0
Vole 7 - 0
Total Acres - 18
Potential MBF - 498
Quarter Quad - KTNC5NE
VCU Number - 744
Photo Number - 1890-45
Alternative Pattern - 30560

★ Landing

Feet

0 526 1056 1582 2112

43.7Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 59 **Planned Acres:** 38.7 **Estimated Volume:** 985.8 **In Alternatives:** 2 , 3 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 7 **Quad:** KTNC5NE **Photo:** 1890-45 **Logging systems:** - RS- SH
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 385 **Original LSTA Unit:** 744-385

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 33.2 Spruce 0.0 Mixed Hem/Spr 0.9 **Nonforested** 0.0 **Aspect:** W
Volume class breakdown: Class 4: 33.2 Class 5: 0.9 Class 6: 0.0 Class 7: 0.0 **Low Productive** 4.6
Visuals: Seen 0.0 Not Seen 38.7 **VQOs:** PR- 0.0 MM- 38.7 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** SPNM **High VAC** 36.6 **Intermediate VAC** 2.1 **Low VAC** 0.0 **Roadless** 38.7
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.1 Class 3 Stream: 7.7 Soils: 0.3
Mass movement Index: Low 7.6 Medium 29.9 High 1.3 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.4 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 7.7 3- 9.7 4- 21.3
High Value Habitat: Sitka Black-Tail Deer- 3.2 Marten- 9.0 River Otter- 4.5 Bald Eagle- 0.0 Black Bear- 31.8
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
East side (O-12) of the unit contains a small (less than 3 acre) area of high landslide potential soils (BMP 13.5). Recommend that at least partial log suspension be achieved in yarding (BMP 13.9). NRB 8/31/95

Timber Input
Planned logging systems design for this unit is Running Skyline and Shovel. Confirm final road and landing locations. Southwestern portion of planned unit appears to be a blindlead. Verify feasibility and modify unit boundary as required.

Engineering Input
Steelhead/Coho/Pink/Chum timing (July 18 - August 7) may apply for all road construction and/or drainage installations. Relocate road to this unit to avoid small population of Choris bog orchids.

Fish/Watershed Input
Class II MC3 stream west (TTRA): slope break plus 100 foot buffer
Class II MM1 stream north (TTRA): 200 foot buffer
Class III HC5 stream south: 75 foot sideslope buffer or split yarding or full suspension required
Class III HC5 stream north: 75 foot sideslope buffer or split yarding or full suspension required

Wildlife Input
Relocate road to this unit to avoid small population of Choris bog orchids.

Recreation / Visuals Input
No concerns WEA 8/28/95

Lands Input
No concerns. NRB 8/31/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
No concerns. NRB 8/31/95

Silviculture Input
Moderately productive with good natural regeneration. Monitor need for artificial regeneration on unstable soils.
Prescription should address partial cut stream buffer. CBD 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 59

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /1stfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Blasting Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Volc 4 - 33
Volc 5 - 1
Volc 6 - 0
Volc 7 - 0
Total Acres - 39
Potential MBF - 986
Quarter Quad - KTNC5WE
VCU Number - 744
Photo Number - 1890-45
Alternative Pattern - 2-30560
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet
0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 61 **Planned Acres:** 15.8 **Estimated Volume:** 348.6 **In Alternatives:** 2 , 3 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 3 **Quad:** KTNC4NW **Photo:** 1890-47 **Logging systems:** - RS- SL
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 396 **Original LSTA Unit:** 744-396

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 11.2 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** N
Volume class breakdown: Class 4: 11.2 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 4.6
Visuals: Seen 0.0 Not Seen 15.8 **VQOs:** PR- 0.0 MM- 15.8 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 15.8 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 15.8
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 1.5 Medium 13.9 High 0.4 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 1.5 3- 4.0 4- 10.3
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 3.4 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 6.9
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
No concerns. NRB 8/31/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Field reconnaissance indicated that the southern portion of planned unit may have a blindlead if final road location is adjusted. Helicopter logging or a backline adjustment may be required to achieve the required suspension.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7)

Fish/Watershed Input
Stream Class III AF2/HC6 west: 140 foot sideslope buffer (BMP 12.6, 12.6a)

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/28/95

Lands Input
No concerns. NRB 8/31/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
V-notch located along the west side (L-10 to K-14) of this unit. Recommend windfirm slope break buffer be maintained along the edge of this V-notch (BMP 13.16). NRB 8/31/95

Silviculture Input
Moderate productivity with good natural regeneration. Past evidence of windthrow indicates need to establish windfirm boundaries. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 61

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vols 4 - 11
Vols 5 - 0
Vols 6 - 0
Vols 7 - 0
Total Acres - 16
Potential MBF - 349
Quarter Quad - KINC4NW
VCU Number - 744
Photo Number - 1890-47
Alternative Pattern - 230560

★ Landing

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 62 **Planned Acres:** 44.2 **Estimated Volume:** 881.5 **In Alternatives:** 2 , 0 , 0 , 0 , 0
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC4NW **Photo:** 1890-47 **Logging systems:** - HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 400 **Original LSTA Unit:** 744-400

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 26.3 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** N
Volume class breakdown: Class 4: 26.3 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 17.9
Visuals: Seen 0.0 Not Seen 44.2 **VQOs:** PR- 0.0 MM- 44.2 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 44.2 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 44.2
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 3.7 Soils: 0.0
Mass movement Index: Low 0.0 Medium 26.0 High 18.2 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.6
Wetland Information: Wetland 2.2 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 44.2 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 15.2
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit includes high landslide potential soils, MMI=3, (BMP 13.5) and forested wetlands (BMP 12.5). Recommend at least partial log suspension when yarded (BMP 13.9). NRB 8/31/95

Timber Input
Planned logging systems design for this unit is Helicopter.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7)

Fish/Watershed Input
Class III HC6 central: split yarding and full suspension required (BMP 13.9)

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/28/95

Lands Input
No concerns. NRB 8/31/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
No concerns. NRB 8/31/95

Silviculture Input
Moderate productivity with small areas of high elevation and high mass movement soils. Apply shelterwood harvest system leaving all trees 13" DBH and under standing. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 62

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fistiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vols 4 - 26
Vols 5 - 0
Vols 6 - 0
Vols 7 - 0
Total Acres - 44
Potential MBF - 882
Quarter Quad - KINC4NW
VCU Number - 744
Photo Number - 1890-47
Alternative Pattern - 20000

★ Landing

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 64 **Planned Acres:** 11.2 **Estimated Volume:** 308.3 **In Alternatives:** 0 , 3 , 0 , 0 , 0
Silvicultural System: See section **Number of Settings:** 1 **Quad:** KTNC4NW **Photo:** 1890-46 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 418 **Original LSTA Unit:** 744-418

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 11.2 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** S
Volume class breakdown: Class 4: 11.2 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 0.0 Not Seen 11.2 **VQOs:** PR- 0.0 MM- 11.2 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 11.2 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 11.2
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 0.0 Medium 7.7 High 3.5 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 11.2 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 1.5
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
No concerns. NRB 8/31/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Final road location will determine if this unit will be cable yarded or helicopter yarded. Verify feasibility and modify unit boundary as required.

Engineering Input
High MMI soils. Road constuction must minimize landslide potential. Oversteepened slopes may require full bench construction and endhaul of waste. (BMP 14.7)

Fish/Watershed Input
No concerns. SPL 1/3/95

Wildlife Input
No blasting May 15 to June 15 to protect mountain goat kidding areas.

Recreation / Visuals Input
No concerns. WEA 8/28/95

Lands Input
No concerns. NRB 8/31/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

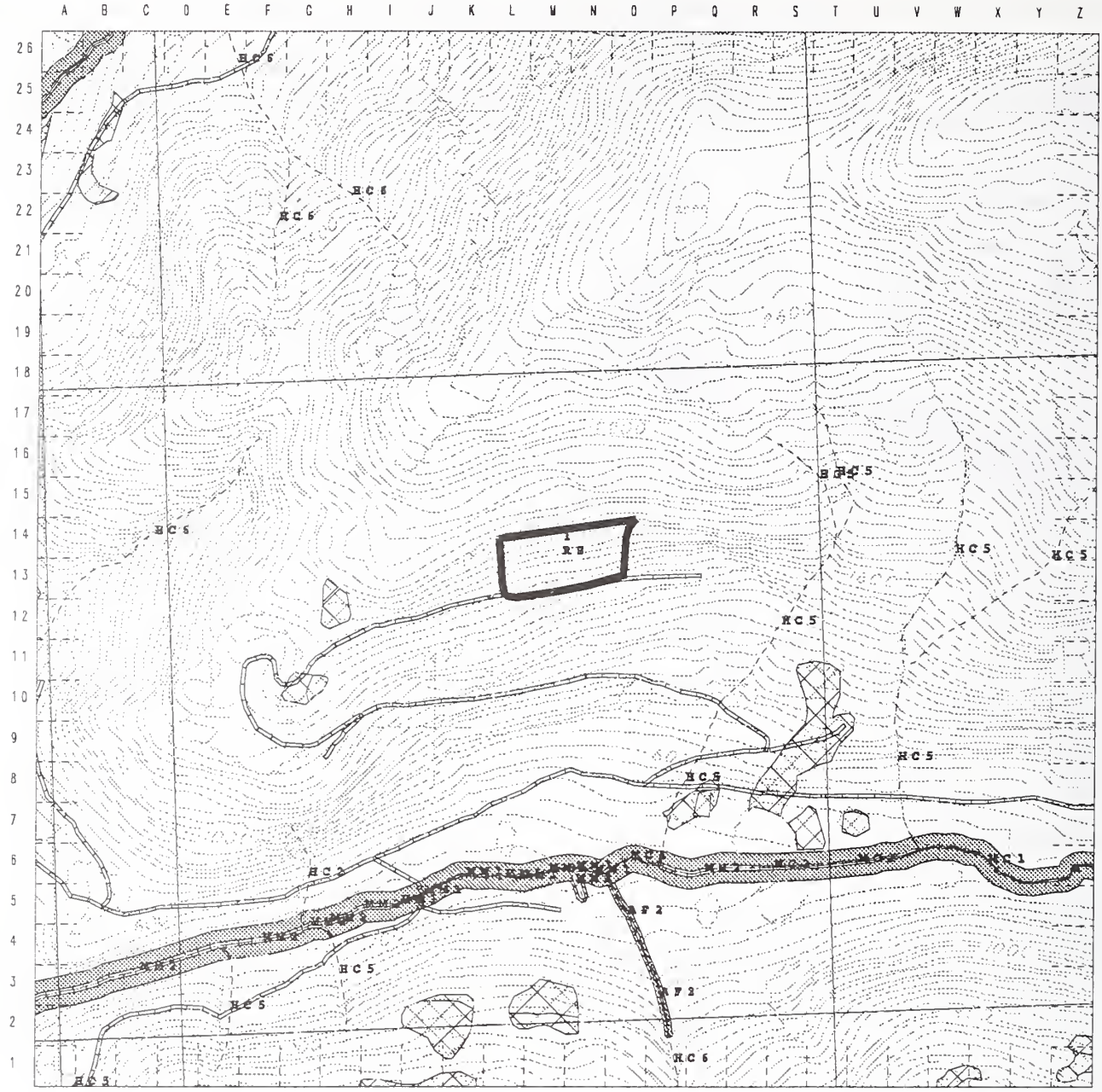
Geological Input
No concerns. NRB 8/31/95

Silviculture Input
High productivity with good natural regeneration. No concerns. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 64

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /isfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 333 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vols 4 - 11
Vols 5 - 0
Vols 6 - 0
Vols 7 - 0
Total Acres - 11
Potential MBF - 308
Quarter Quad - KINC4NW
VCU Number - 744
Photo Number - 1890-46
Alternative Pattern - 3000
★ Landing

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 65 **Planned Acres:** 29.3 **Estimated Volume:** 805.8 **In Alternatives:** 0 , 3 , 0 , 0 , 0
Silvicultural System : See section **Number of Settings:** 4 **Quad:** KTNC4NW **Photo:** 1890-46 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 420 **Original LSTA Unit:** 744-420

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 29.3 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** S
Volume class breakdown: Class 4: 29.3 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 0.0 Not Seen 29.3 **VQOs:** PR- 0.0 MM- 29.3 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 29.3 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 29.3
Riparian MA: **Class 1 Stream:** 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 0.0 Medium 17.4 High 11.9 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 9.1
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 29.3 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 15.9
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit consists mostly of high landslide potential soils, MMI=3 (BMP 13.5). Recommend at least partial log suspension when yarding (BMP 13.5). Road construction will require full bench and end haul of over burden (BMPs 14.7, 14.12) over much of the length of the proposed road. NRB 8/31/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Final road location will determine the feasibility of the planned upper unit boundary.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. Oversteepened slopes may require full bench construction and endhaul of waste. (BMP 14.7)

Fish/Watershed Input
No fisheries concerns.

Wildlife Input

No blasting May 15 to June 15 to protect mountain goat kidding areas.

Recreation / Visuals Input
No concerns WEA 8/28/95

Lands Input
No concerns. NRB 8/31/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

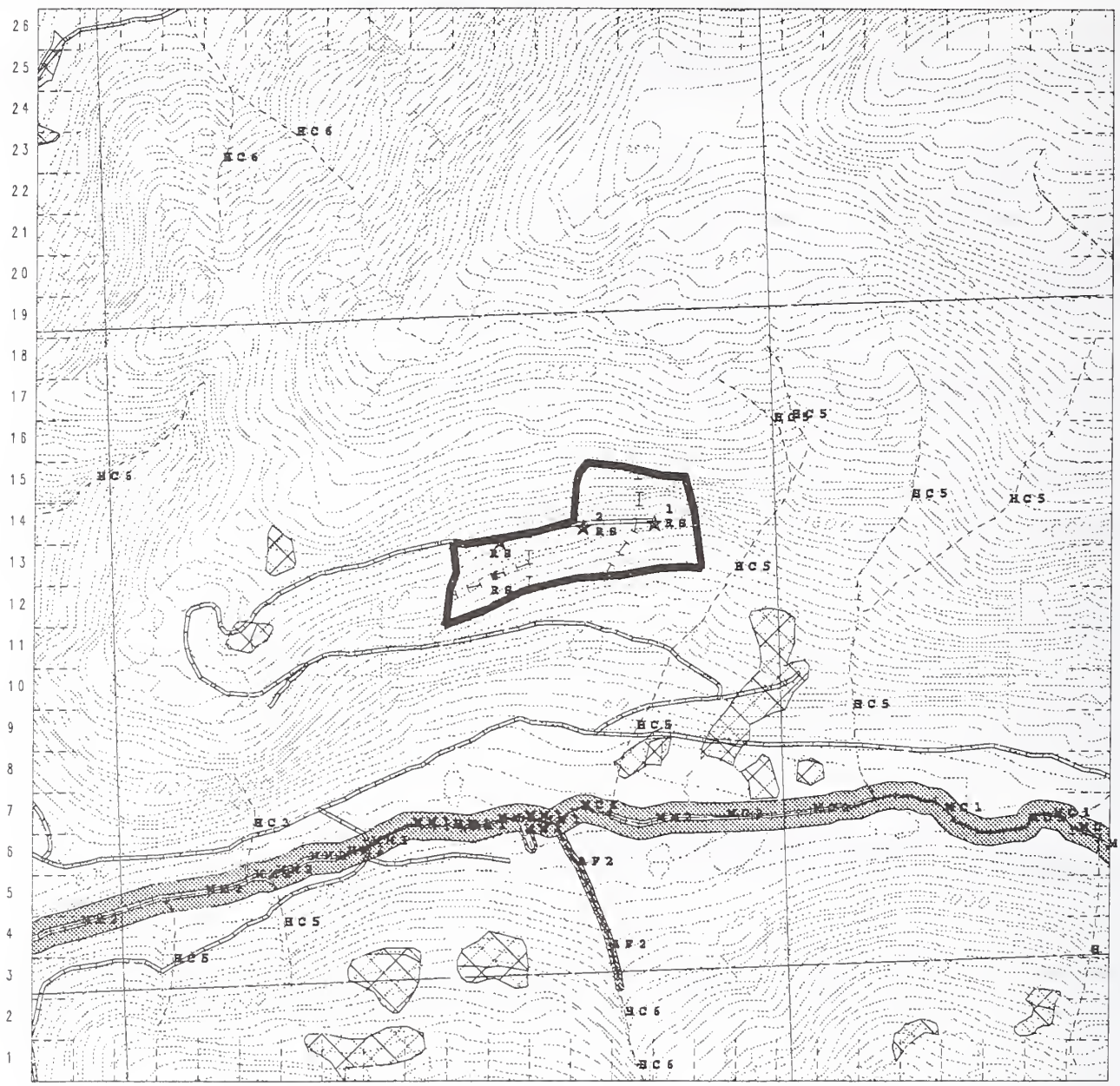
Geological Input
No concerns. NRB 8/31/95

Silviculture Input
Moderate productivity with small areas of Hydric and Mass movement prone soils that will need to be planted. (3 acres) CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 65

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /1stfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vols 4 - 29
Vols 5 - 0
Vols 6 - 0
Vols 7 - 0
Total Acres - 29
Potential MBF - 806
Quarter Quad - KINC4NW
VCU Number - 744
Photo Number - 1890-46
Alternative Pattern - 3000

★ Landing

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 66 **Planned Acres:** 55.0 **Estimated Volume:** 1,347.5 **In Alternatives:** 2 , 3 , 5 , 0 , 0
Silvicultural System : See section **Number of Settings:** 8 **Quad:** KTNC4NW **Photo:** 1890-46 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 421 **Original LSTA Unit:** 744-421

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 46.2 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** S
Volume class breakdown: Class 4: 46.2 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 8.8
Visuals: Seen 6.4 Not Seen 48.6 **VQOs:** PR- 0.0 MM- 48.6 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 55.0 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 55.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 3.7 Medium 18.6 High 32.6 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 20.2
Wetland Information: Wetland 3.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 3.7 3- 31.3 4- 19.9
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 9.4
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Upper slopes (K-14 to P-15) in this unit include low productivity, subalpine, mountain hemlock and mixed conifer series sites. Regeneration and growth on these sites may be a concern. Road construction will require some full bench and end haul of waste material (BMPs 14.7 and 14.12). NRB 8/31/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Final road location will determine if unit will be cable yarded or converted to helicopter yarding.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. Oversteepened slopes may require full bench construction and endhaul of waste. (BMP 14.7)

Fish/Watershed Input
No fisheries concerns

Wildlife Input
No blasting May 15 to June 15 to protect mountain goat kidding areas.

Recreation / Visuals Input
No concerns. WEA 9/30/95

Lands Input
No concerns. NRB 8/31/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
No concerns. NRB 8/31/95

Silviculture Input
High productivity yet scattered pockets of Alaska yellow cedar decline and landslide prone soils exist. High elevation areas will require planting. (3 acres). Past evidence of windthrow indicates need for windfirm boundary location. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 66

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /tsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Volc 4 - 46
Volc 5 - 0
Volc 6 - 0
Volc 7 - 0
Total Acres - 55
Potential MBF - 1348
Quarter Quad - KTNC4NW
VCU Number - 744
Photo Number - 1890-46
Alternative Pattern - 23050
★ Landing

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet
0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 67 **Planned Acres:** 40.6 **Estimated Volume:** 906.5 **In Alternatives:** 2 , 3 , 5 , 0 , 0
Silvicultural System : See section **Number of Settings:** 3 **Quad:** KTNC5NE **Photo:** 1890-46 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 423 **Original LSTA Unit:** 744-423

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 29.4 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** SW
Volume class breakdown: Class 4: 29.4 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 11.3
Visuals: Seen 1.7 Not Seen 38.9 **VQOs:** PR- 0.0 MM- 38.9 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 40.6 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 40.6
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 4.4 Soils: 0.0
Mass movement Index: Low 5.1 Medium 24.3 High 11.3 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 1.2
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.8 **Site Productivity Classes** 1- 0.8 2- 5.1 3- 6.2 4- 28.6
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 26.5
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
The upper slopes (M-16 to O-12) of this unit includes high landslide potential soils, MMI=3 (BMP 13.5). Recommend at least partial log suspension when yarding (BMP 13.9).

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Eastern portion of planned unit appears to be a blindlead. Run profiles to verify feasibility and modify unit boundary as required.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7) Steelhead/Coho/Pink/Chum timing (July 18 - August 7) may apply for all road construction and/or drainage installations.

Fish/Watershed Input
Class II MC2 stream northwest (TTRA): sideslope plus 100 foot buffer
Class II MC2 stream southwest (TTRA): sideslope plus 100 foot buffer
Class III MC2 stream southcentral: split yarding or full suspension required

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns. WEA 9/30/95

Lands Input
No concerns. NRB 8/31/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
No concerns. NRB 8/31/95

Silviculture Input
High productivity with small areas of high elevation and high mass movement soils. Planting will be required, using Alaska yellow cedar if available. (5 acres)
CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 67

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /tsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Flooring Roads
Unit Boundary
Setting Line
Contour or Orthophoto

Beach or Estuary Buffer
Private Land
Implementation Buffer
Roadstream 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vols 4 - 29
Vols 5 - 0
Vols 6 - 0
Vols 7 - 0
Total Acres - 41
Potential MBF - 906
Quarter Quad - KINGSME
VCU Number - 744
Photo Number - 1890-46
Alternative Pattern - 23050

★ Landing

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 68 **Planned Acres:** 4.2 **Estimated Volume:** 54.2 **In Alternatives:** 2 , 3 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC5NE **Photo:** 1573-160 **Logging systems:** - LS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 424 **Original LSTA Unit:** 744-424

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 0.9 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** W
Volume class breakdown: Class 4: 0.9 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 3.3
Visuals: Seen 0.0 Not Seen 4.2 **VQOs:** PR- 0.0 MM- 4.2 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 4.2 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 4.2
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 3.1 Medium 1.1 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 3.1 3- 1.1 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 4.2
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
No concerns. NRB 8/31/95

Timber Input
Planned logging systems design for this unit is Live Skyline. Confirm final road and landing locations.

Engineering Input
There are no engineering mitigation measures anticipated for this unit.

Fish/Watershed Input
Class II HC3 stream south (TTRA): 100 foot no cut buffer (BMP 12.6 and 12.6a)
Class II MC2 stream west (TTRA): 100 foot no cut buffer (BMP 12.6 and 12.6a)

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/28/95

Lands Input
No concerns, NRB 8/31/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

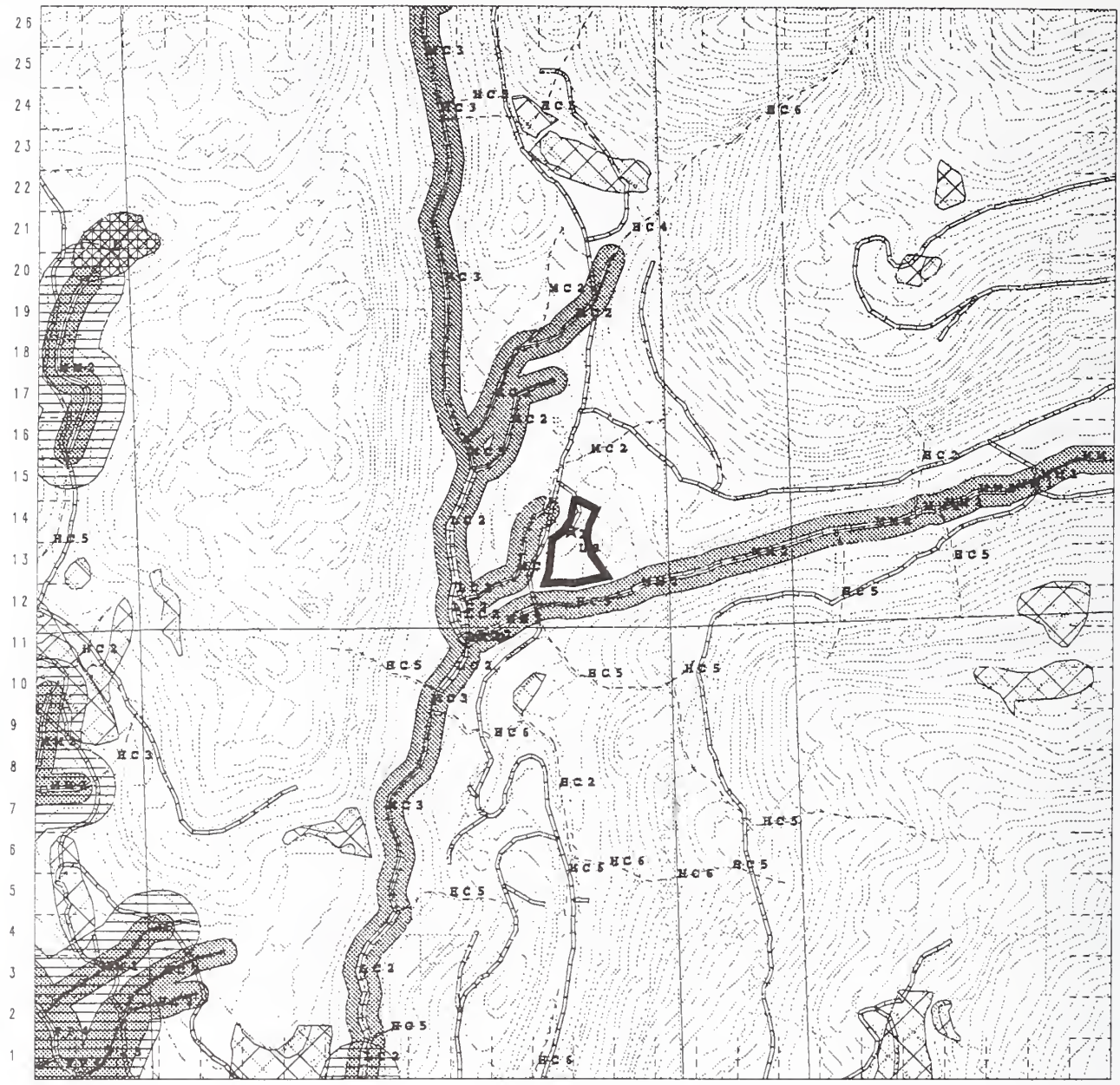
Geological Input
No concerns. 8/31/95

Silviculture Input
Low productivity. Monitor regeneration to determine if planting will be necessary. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 68

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fistiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Pleoniog Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Roadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vole 4 - 1
Vole 5 - 0
Vole 6 - 0
Vole 7 - 0
Total Acres - 4
Potential MBF - 54
Quarter Quad - KINGSNE
VCU Number - 744
Photo Number - 1573-160
Alternative Pattern - 230560
★ Landing

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 72 **Planned Acres:** 29.7 **Estimated Volume:** 889.1 **In Alternatives:** 2 , 3 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 4 **Quad:** KTNC5NE **Photo:** 1573-160 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 430 **Original LSTA Unit:** 744-430

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 29.4 Spruce 0.0 Mixed Hem/Spr 0.3 **Nonforested** 0.0 **Aspect:** SW
Volume class breakdown: Class 4: 19.6 Class 5: 10.1 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 9.4 Not Seen 20.4 **VQOs:** PR- 0.0 MM- 20.4 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 29.7 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 29.7
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.9 Class 3 Stream: 6.9 Soils: 2.4
Mass movement Index: Low 0.0 Medium 23.2 High 6.6 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 3.4 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 3.4 4- 26.4
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 29.7
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
High landslide potential soils are found in the central (N-13) part of the unit (BMP 13.5). Recommend at least partial log suspension when yarding to minimize soil surface disturbance (BMP 13.9). A small area of forested wetland (BMP 12.5) is located in the south (M-11) part of the unit. This area could be shovel logged (BMP 13.9). NRB 8/31/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Eastern portion of planned unit appears to be a blindlead. Verify feasibility and modify unit boundary as required.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7)

Fish/Watershed Input
Class II MC3 stream west (TTRA): 100 foot buffer (BMP 12.6 and 12.6a)
Class III HC3 stream north: sideslope buffer (BMP 12.6)

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
Mainline road runs through unit. Identified VQO is maximum modification. WEA 9/30/95

Lands Input
No concerns. NRB 8/31/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
No concerns. NRB 8/31/95

Silviculture Input
High productivity with small areas of high elevation and high mass movement soils. Planting will be required, using high elevation Sitka spruce or Alaska yellow cedar if available. (3 acres) CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 72

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /1stfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 100 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vols 4 - 20
Vols 5 - 10
Vols 6 - 0
Vols 7 - 0
Total Acres - 30
Potential MBF - 889
Quarter Quad - R1NC5NE
VCU Number - 744
Photo Number - 1573-160
Alternative Pattern - 230560

★ Landing

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 73 **Planned Acres:** 35.7 **Estimated Volume:** 1,059.4 **In Alternatives:** 2 , 3 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 4 **Quad:** KTNC5NE **Photo:** 1890-44 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D69B **WAA Number:** 510 **NOI Unit:** 431 **Original LSTA Unit:** 744-431

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 28.8 Spruce 0.0 Mixed Hem/Spr 0.1 **Nonforested** 0.0 **Aspect:** NW
Volume class breakdown: Class 4: 0.0 Class 5: 28.8 Class 6: 0.1 Class 7: 0.0 **Low Productive** 6.8
Visuals: Seen 0.0 Not Seen 35.7 **VQOs:** PR- 0.0 MM- 35.7 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 35.7 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 35.7
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.6 Class 3 Stream: 0.0 Soils: 0.1
Mass movement Index: Low 4.1 Medium 31.6 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.1
Wetland Information: Wetland 8.8 Mix Wetland 0.0 Riparian Soil 0.1 **Site Productivity Classes** 1- 4.2 2- 0.0 3- 31.3 4- 0.2
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 17.3
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit consists of a combination of high landslide potential, MMI=3 (BMP 13.5), soils and forested wetlands (BMP 12.5). These areas will require at least partial log suspension during yarding to minimize soil surface disturbance (BMP 13.9). NRB 9/18/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. Oversteepened slopes may require full bench construction and endhaul of waste. (BMP 14.7)

Fish/Watershed Input
Class II MC2 stream north (TTRA): 100 foot buffer (BMP 12.6, 12.6a)
Class II FP3 stream east: 130 foot buffer (BMP 12.6, 12.6a)

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 9/18/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

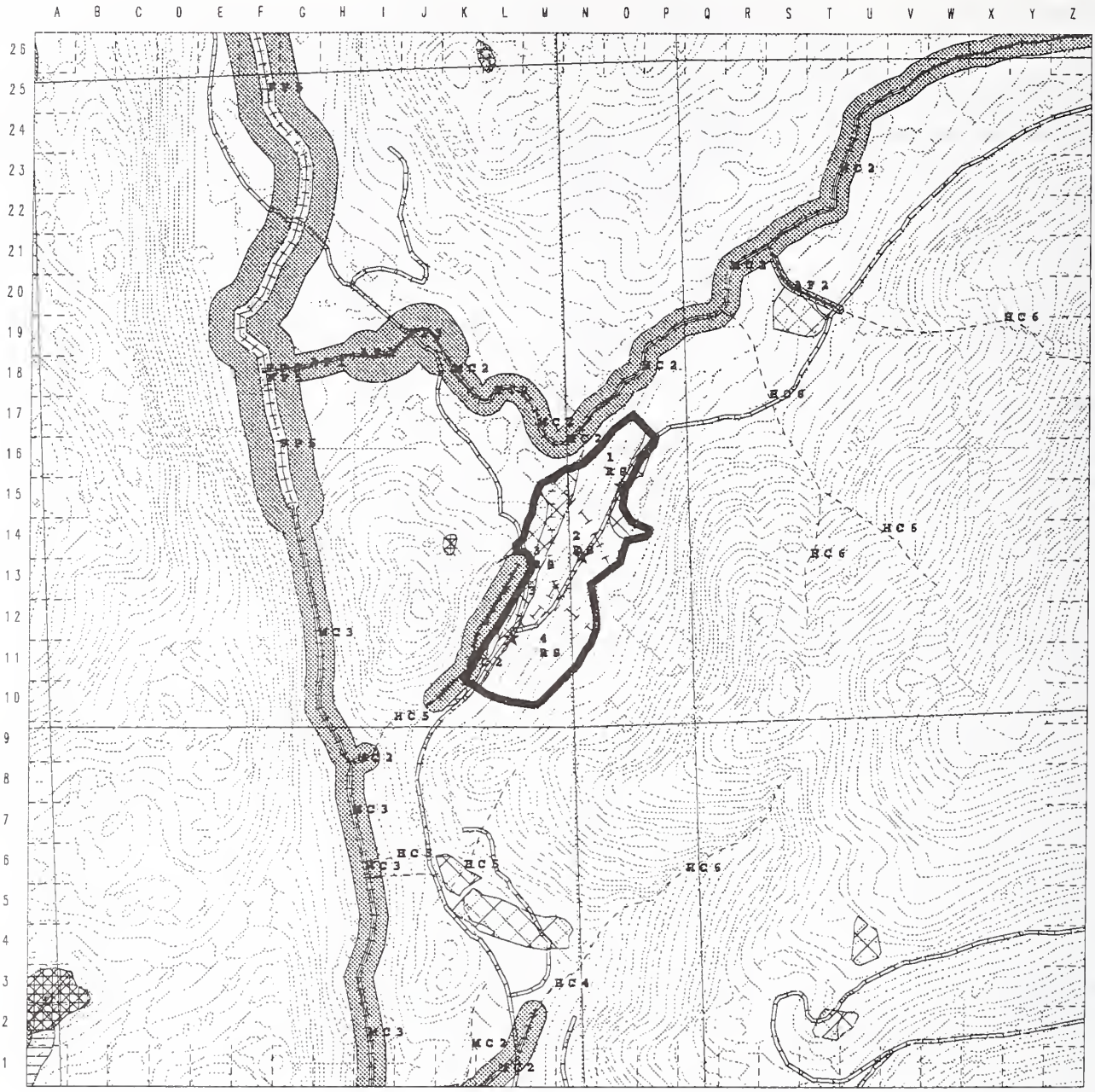
Geological Input
No concerns. NRB 9/18/95

Silviculture Input
High productivity with small areas of Hydric soils that will need to be planted. (3 acres) CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 73

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 100 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vols 4 - 0
Vols 5 - 29
Vols 6 - 0
Vols 7 - 0
Total Acres - 36
Potential MBF - 1059
Quarter Quad - KINC5NE
VCU Number - 744
Photo Number - 1890-44
Alternative Pattern - 230560
★ Landing

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 74 **Planned Acres:** 5.1 **Estimated Volume:** 65.6 **In Alternatives:** 2 , 3 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC4NW **Photo:** 1890-44 **Logging systems:** - HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D69B **WAA Number:** 510 **NOI Unit:** 437 **Original LSTA Unit:** 744-437

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 1.1 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** N
Volume class breakdown: Class 4: 1.1 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 4.0
Visuals: Seen 0.0 Not Seen 5.1 **VQOs:** PR- 0.0 MM- 5.1 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 5.1 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 5.1
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 0.0 Medium 0.0 High 5.1 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.4
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 5.1 3- 0.0 4 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 1.1
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit is made up of high landslide potential soils, MMI=3 (BMP 13.5) Recommend at least partial log suspension during yarding (BMP 13.9) NRB 9/18/95

Timber Input
Planned logging systems design for this unit is Helicopter.

Engineering Input
There are no engineering mitigation measures anticipated for this unit.

Fish/Watershed Input
No concerns. SPL 1/3/95

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No Concerns WEA 8/29/95

Lands Input
No concerns. NRB 9/18/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
No concerns. NRB 9/18/95

Silviculture Input
Low productivity, apply shelterwood harvest system leaving all trees 13" DBH and under standing. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 74

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fstiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Volc 4 - 1
Volc 5 - 0
Volc 6 - 0
Volc 7 - 0
Total Acres - 5
Potential MBF - 86
Quarter Quad - KINC4NW
VCU Number - 744
Photo Number - 1890-44
Alternative Pattern - 230560
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet
0 525 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 76 **Planned Acres:** 29.8 **Estimated Volume:** 608.5 **In Alternatives:** 2 , 0 , 0 , 0 , 0
Silvicultural System : See section **Number of Settings:** 3 **Quad:** KTNC5NE **Photo:** 1890-10 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D69B **WAA Number:** 510 **NOI Unit:** 445 **Original LSTA Unit:** 744-445

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 18.5 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** SE
Volume class breakdown: Class 4: 18.5 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 11.2
Visuals: Seen 0.0 Not Seen 29.8 **VQOs:** PR- 0.0 MM- 29.8 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 29.8 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 29.8
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 29.8 Medium 0.0 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 29.8 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 29.8 3- 0.0 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 22.9
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit consists of a mixture of upland and wetland soils on fairly gentle slopes (BMP 12.5). Much of the this unit is suitable for shovel logging (BMP 13.9).

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations.

Engineering Input
There are no engineering mitigation measures anticipated for this unit.

Fish/Watershed Input
Class II MM2 stream west (TTRA): 120 foot buffer (BMP 12.6 and 12.6a)

Wildlife Input
Maintain distribution of snags by leaving 1-5 acre-sized island of green trees at a rate of 1 acre of island for every 20 acres harvested. Leave islands must be compatible with logging systems and safe working conditions.

Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 9/18/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

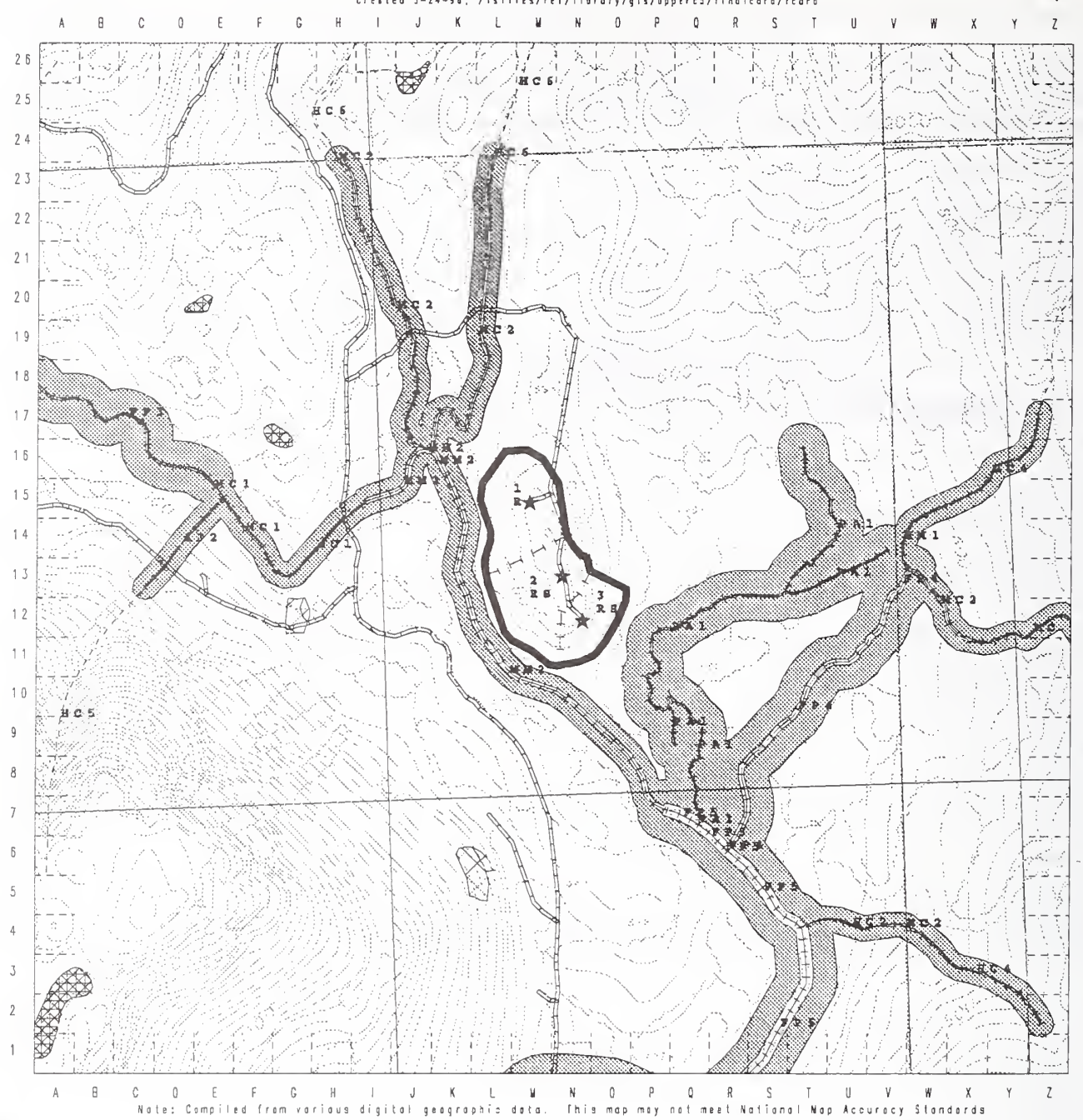
Geological Input
No concerns. NRB 9/18/95

Silviculture Input
Moderate productivity with small areas of Hydric soils that will need to be planted. (3 acres) CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 76

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /tsfiles/rel/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vole 4 - 19
Vole 5 - 0
Vole 6 - 0
Vole 7 - 0
Total Acres - 30
Potential MBF - 608
Quarter Quad - K1NC5NE
VCU Number - 744
Photo Number - 1890-10
Alternative Pattern - 20000
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet
0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 77 **Planned Acres:** 7.2 **Estimated Volume:** 198.4 **In Alternatives:** 2 , 0 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 2 **Quad:** KTNC5NE **Photo:** 1890-8 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D69B **WAA Number:** 510 **NOI Unit:** 447 **Original LSTA Unit:** 744-447

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 7.2 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** SW
Volume class breakdown: Class 4: 7.2 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 0.0 Not Seen 7.2 **VQOs:** PR- 0.0 MM- 7.2 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 7.2 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 7.2
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 0.0 Medium 5.5 High 1.7 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3 7.2 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 6.1
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit contains high landslide potential soils, MMI=3 (BMP 13.5). Recommend at least partial log suspension during yarding to mininize soil surface disturbance (BMP 13.9). NRB 9/18/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7)

Fish/Watershed Input
No concerns. SPL 1/3/95

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 9/18/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

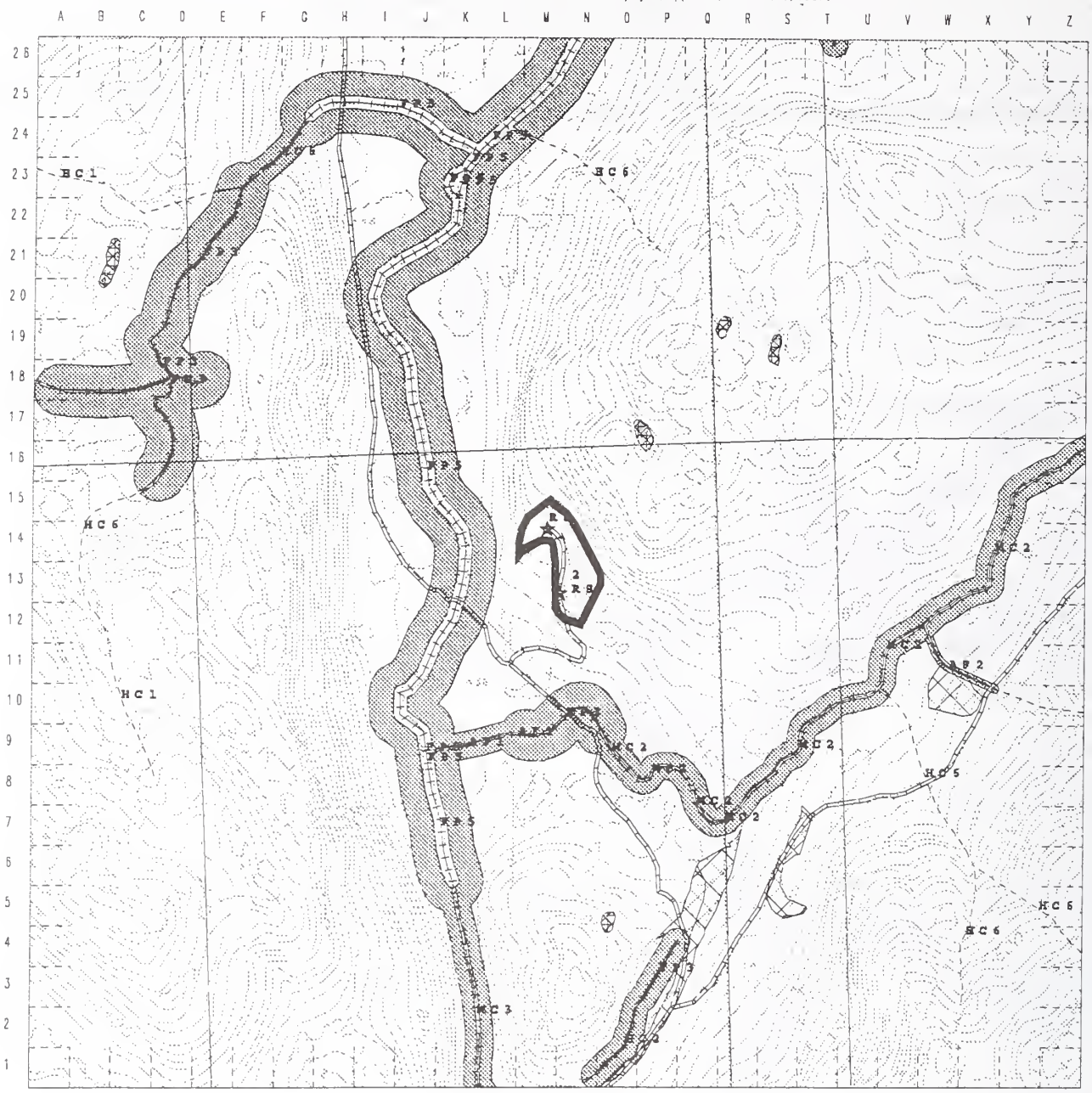
Geological Input
V-notch passes through the middle of the proposed harvest unit (BMP 13.5). Recommend that yarding be split on this V-notch (BMP 13.9) and that a windfirm slope-break buffer be retained within the V-notch (BMP 12.6a). Road construction across this V-notch will require some full bench roading with end haul of waste material (BMP 14.7). Waste material may be disposed of below the switch-back, just south of the unit (BMP 14.12) NRB 9/18/95

Silviculture Input
High productivity with small areas of wetland soils and high mass movement soils. Planting will be required, using Alaska yellow cedar if available. (1 acre) CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 77

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /isfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 100 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Volc 4 - 7
Volc 5 - 0
Volc 6 - 0
Volc 7 - 0
Total Acres - 7
Potential MBF - 198
Quarter Quad - KINGSNE
VCU Number - 744
Photo Number - 1890-8
Alternative Pattern - 200560
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet

0 526 1055 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 81 **Planned Acres:** 25.5 **Estimated Volume:** 852.2 **In Alternatives:** 2 , 0 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 3 **Quad:** KTNC5NE **Photo:** 1890-10 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D69B **WAA Number:** 510 **NOI Unit:** 462 **Original LSTA Unit:** 744-462

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type: Cedar 0.0 Hemlock 25.1 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** NW
Volume class breakdown: Class 4: 2.4 Class 5: 22.6 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.4
Visuals: Seen 0.0 Not Seen 25.5 **VQOs:** PR- 0.0 MM- 25.5 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 25.5 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 25.5
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 25.5
Mass movement Index: Low 0.0 Medium 18.6 High 6.9 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 25.5 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 14.3

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Slopes above this unit have a very-high landslide potential, MMI=4 (BMP 13.5). Recommend that the backline be located at the foot of this slope (BMP 13.2). NRB 9/18/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Southeastern portion of planned unit appears to be a blindlead. Verify feasibility and modify unit boundary or final road location (gain maximum deflection angle) as required. Northernmost portion of unit may overlap into MMI 4 soils, verify and adjust unit boundary as necessary.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7)

Fish/Watershed Input
No fisheries concerns identified in this unit.

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 9/18/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
No concerns. 9/18/95

Silviculture Input
High productivity with small areas of high elevation and high mass movement soils. Planting will be required, using high elevation Sitka spruce or Alaska yellow cedar if available. (6 acres) 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 81

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fsfiles/ref/library/gis/upperc5/finalcord/fcord



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 100 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vols 4 - 2
Vols 5 - 23
Vols 6 - 0
Vols 7 - 0
Total Acres - 25
Potential MBF - 852
Quarter Quad - KINGSNE
VCU Number - 744
Photo Number - 1890-10
Alternative Pattern - 200560

★ Landing

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 82 **Planned Acres:** 23.9 **Estimated Volume:** 978.7 **In Alternatives:** 2 , 0 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 4 **Quad:** KTNC5NE **Photo:** 1890-10 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D69B **WAA Number:** 510 **NOI Unit:** 464 **Original LSTA Unit:** 744-464

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 0.0 Spruce 0.0 Mixed Hem/Spr 23.6 **Nonforested** 0.0 **Aspect:** NE
Volume class breakdown: Class 4: 0.0 Class 5: 8.5 Class 6: 15.1 Class 7: 0.0 **Low Productive** 0.3
Visuals: Seen 0.0 Not Seen 23.9 **VQOs:** PR- 0.0 MM- 23.9 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 23.9 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 23.9
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 0.0 Medium 23.9 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.9 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 23.9 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 17.1 River Otter- 0.8 Bald Eagle- 0.8 Black Bear- 23.9
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Southeast end of this unit contains some forested wetland (BMP 12.5). This area is suitable for shovel yarding (BMP 13.9). NRB 9/21/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Southern portion of planned unit appears to be a blindlead depending on final road location. Verify feasibility and modify unit boundary, final road location, or access southern portion of unit with a temp road.

Engineering Input
There are no engineering mitigation measures anticipated for this unit.

Fish/Watershed Input
Class II FP3 stream northwest (TTRA): 200 foot no cut buffer (BMP 12.6 and 12.6a)
Class II MC1 stream northeast (TTRA): 100 foot no cut buffer (BMP 12.6 and 12.6a)
Class III AF1 stream central: 140 foot varible no cut buffer (BMP 12.6 and 12.6a)

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 9/21/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
No concerns. NRB 9/21/95

Silviculture Input
High productivity with small areas of Hydric soils as well as an old slide. Planting will be required, using Sitka spruce and Alaska yellow cedar if available. (3 acres) CBG 10/17/95.

Upper Carroll Study Area Unit Schematic - Final Unit 82

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /tsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 100 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vole 4 - 0
Vole 5 - 9
Vole 6 - 15
Vole 7 - 0
Total Acres - 24
Potential MBF - 979
Quarter Quad - KTNC5NE
VCU Number - 744
Photo Number - 1890-10
Alternative Pattern - 200560

★ Landing

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 83 **Planned Acres:** 21.3 **Estimated Volume:** 477.2 **In Alternatives:** 2 , 0 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 3 **Quad:** KTNC5NE **Photo:** 1890-10 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D69B **WAA Number:** 510 **NOI Unit:** 466 **Original LSTA Unit:** 744-466

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 12.7 Spruce 0.0 Mixed Hem/Spr 2.0 **Nonforested** 0.0 **Aspect:** E
Volume class breakdown: Class 4: 12.7 Class 5: 2.0 Class 6: 0.0 Class 7: 0.0 Low Productive 6.6
Visuals: Seen 0.0 Not Seen 21.3 **VQOs:** PR- 0.0 MM- 21.3 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 21.3 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 21.3
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 19.6
Mass movement Index: Low 1.7 Medium 19.4 High 0.0 Very High 0.1 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.3 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 1.7 3- 19.5 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 15.4
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Small area (about 2 acres) of very high landslide potential, MMI=4, is located inthe middle (N-14) (BMP 13.5). Recommend split yarding on this site and retain as wildlife island (BMP 13.9). No concerns in rest of the unit. NRB 9/21/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Western portion of planned unit appears to be a blindlead. Verify feasibility and modify unit boundary as required.

Engineering Input
There are no engineering mitigation measures anticipated for this unit.

Fish/Watershed Input
Class II FP5 stream south (TTRA): 260 foot buffer (BMP 12.6, 12.6a)

Wildlife Input
Retain MMI=4 soils area as a wildlife island (N-14).

Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 9/21/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
No concerns. NRB 9/21/95

Silviculture Input
High productivity with small areas of high elevation and high mass movement soils. Planting will be required, using high elevation Sitka spruce or Alaska yellow cedar if available. (3 acres) CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 83

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /1stiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vols 4 - 13
Vols 5 - 2
Vols 6 - 0
Vols 7 - 0
Total Acres - 21
Potential MBF - 477
Quarter Quad - KINC5NE
VCU Number - 744
Photo Number - 1890-10
Alternative Pattern - 200580

★ Landing

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 84 **Planned Acres:** 20.6 **Estimated Volume:** 558.2 **In Alternatives:** 2 , 0 , 5 , 0 , 0
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC5NE **Photo:** 1890-8 **Logging systems:** - HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D69B **WAA Number:** 510 **NOI Unit:** 471 **Original LSTA Unit:** 744-471

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 0.0 Spruce 0.0 Mixed Hem/Spr 20.1 **Nonforested** 0.0 **Aspect:** NE
Volume class breakdown: Class 4: 20.1 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.5
Visuals: Seen 0.0 Not Seen 20.6 **VQOs:** PR- 0.0 MM- 20.6 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 20.6 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 20.6
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 1.4 Soils: 0.0
Mass movement Index: Low 0.0 Medium 20.6 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 20.6 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 0.0
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
No concerns. NRB 9/21/95

Timber Input
Planned logging systems design for this unit is Helicopter.

Engineering Input
There are no engineering mitigation measures anticipated for this unit

Fish/Watershed Input
Class III HC6 stream east: sideslope buffer (BMP 12.6 and 12.6a)

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 9/21/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
No concerns. NRB 9/21/95

Silviculture Input
Low productivity with small areas of high elevation and high mass movement soils. Apply shelterwood harvest system leaving all trees 13" DBH and under standing. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 84

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /isfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 100 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vole 4 - 20
Vole 5 - 0
Vole 6 - 0
Vole 7 - 0
Total Acres - 21
Potential MBF - 558
Quarter Quad - KINCSNE
VCU Number - 744
Photo Number - 1890-8
Alternative Pattern - 20050
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 85 **Planned Acres:** 49.6 **Estimated Volume:** 1,662.7 **In Alternatives:** 2 , 0 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC5NE **Photo:** 1890-6 **Logging systems:** - HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 494 **Original LSTA Unit:** 744-494

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 49.6 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** E
Volume class breakdown: Class 4: 7.0 Class 5: 42.6 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 0.0 Not Seen 49.6 **VQOs:** PR- 0.0 MM- 49.6 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 49.6 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 49.6
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 15.5 Soils: 0.0
Mass movement Index: Low 1.4 Medium 13.9 High 34.2 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 27.5
Wetland Information: Wetland 1.3 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 5.1 2- 0.0 3- 43.5 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.8 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 24.7
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Much of this unit is made up of high landslide potential, MMI=3, soils (BMP 13.5). Planned helicopter yarding will provide full log suspension and minimize potential for soil disturbance (BMP 13.9). NRB 9/21/95.

Timber Input
Planned logging systems design for this unit is Helicopter.

Engineering Input
There are no engineering mitigation measures anticipated for this unit.

Fish/Watershed Input
Class III HC5 streams south: split yard and full suspension required (BMP13.9).
Class III HC5 stream north: sideslope buffer required (BMP12.6).

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 9/21/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

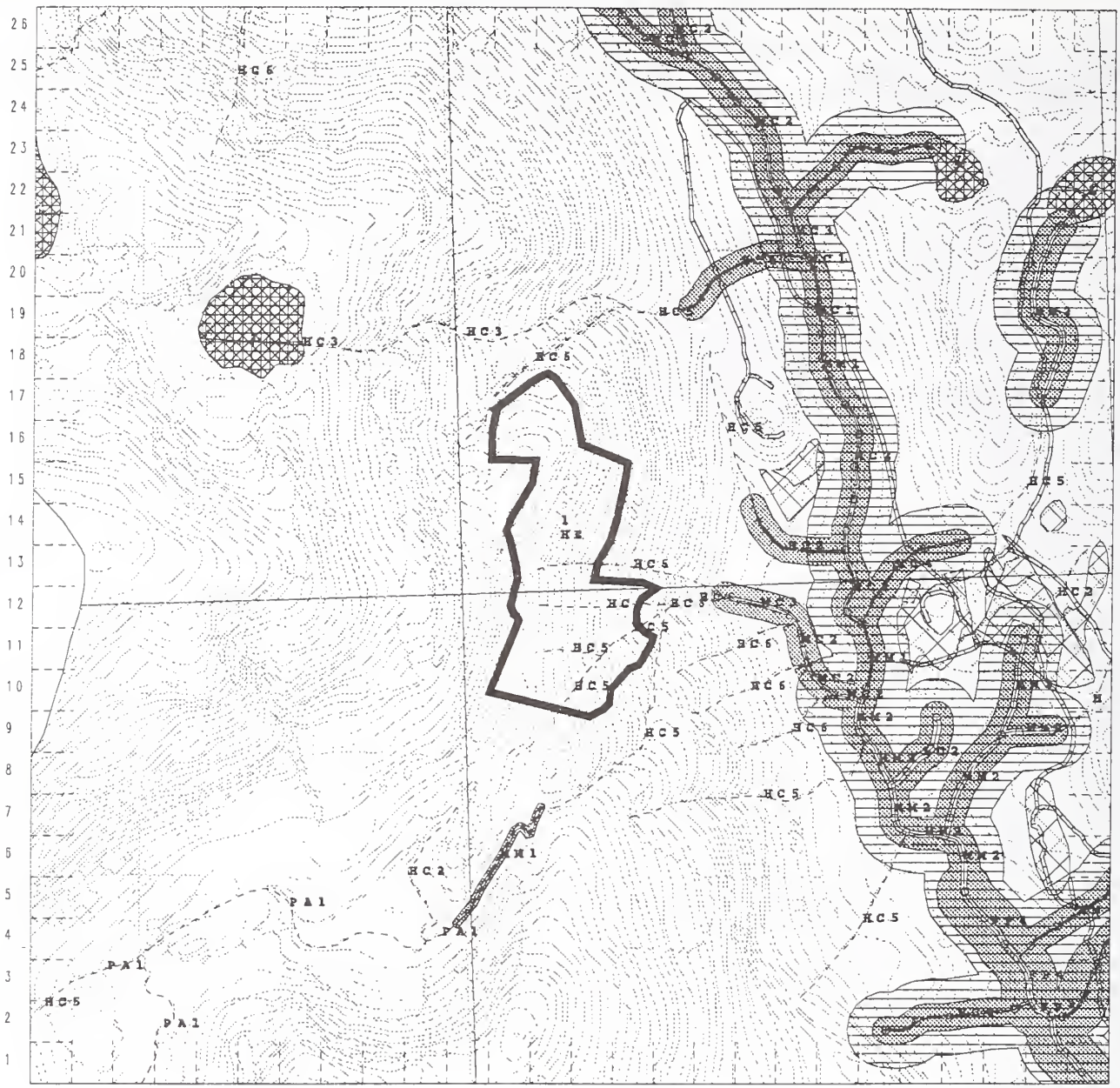
Geological Input
Unit contains several V-notches. For management recommendations see FISH/WATERSHED INPUT above. NRB 9/21/95

Silviculture Input
Highly productive with small areas of high elevation and high mass movement soils. Apply shelterwood harvest system leaving all trees 13" DBH and under standing. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 85

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /tsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vole 4 - 7
Vole 5 - 43
Vole 6 - 0
Vole 7 - 0
Total Acres - 50
Potential MBF - 1663
Quarter Quad - KTNC5NE
VCU Number - 744
Photo Number - 1890-5
Alternative Pattern - 200560
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 86 **Planned Acres:** 13.5 **Estimated Volume:** 353.2 **In Alternatives:** 2 , 0 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 3 **Quad:** KTNC5NE **Photo:** 1890-6 **Logging systems:** - RS- HE- SH
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 497 **Original LSTA Unit:** 744-497

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 12.0 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** SW
Volume class breakdown: Class 4: 10.8 Class 5: 1.3 Class 6: 0.0 Class 7: 0.0 **Low Productive** 1.5
Visuals: Seen 0.0 Not Seen 13.5 **VQOs:** PR- 0.0 MM- 13.5 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 13.5 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 13.5
Riparian MA: Class 1 Stream: 0.1 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 0.4 Medium 13.1 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1 0.0 2 0.4 3 13.1 4 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 3.6 River Otter- 3.4 Bald Eagle- 0.0 Black Bear- 13.5
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit consists of a mixture of wetland and upland soils (BMP 12.5). Recommend shovel yarding where terrain is suitable and at least partial log suspension when cable yarding (BMP 13.9). Road construction should avoid wetlands if possible (BMP 14.3). NRB 9/21/95

Timber Input
Planned logging systems design for this unit is Running Skyline and Shovel. Confirm final road and landing locations.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7) Steelhead/Coho/Pink/Chum timing (July 18 - August 7) may apply for all road construction and/or drainage installations.

Fish/Watershed Input
Class I MM1 stream west: 120 foot no cut buffer (BMP 12.6,12.6a)
Class I MC2 stream norhtwest: 100 foot no cut buffer (BMP 12.6, 12.6a).

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 9/21/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

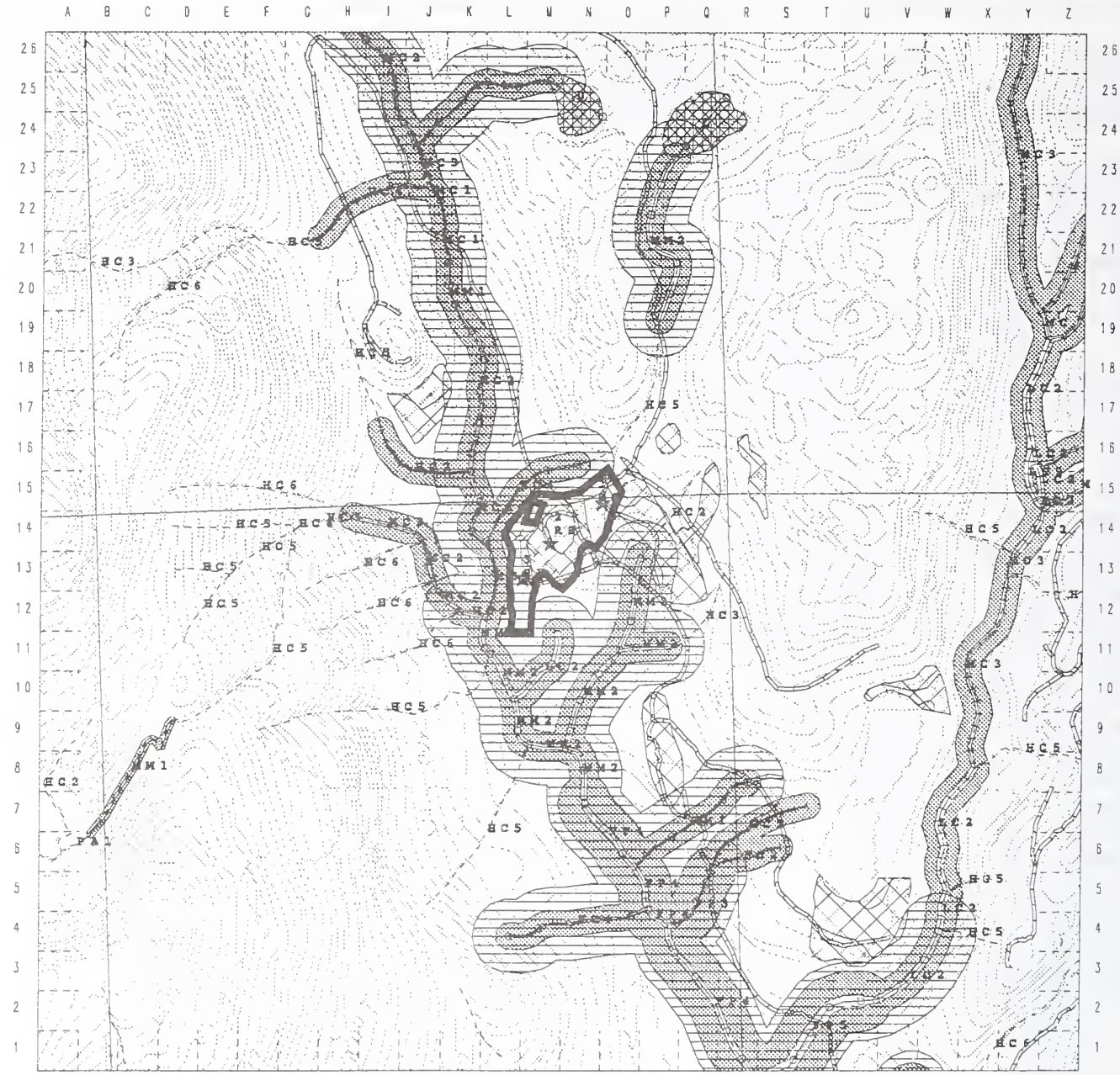
Geological Input
No concerns. 9/21/95

Silviculture Input
Moderate productivity with small areas of Hydric soils that will need to be planted. (3 acres) CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 86

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /isfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vals 4 - 11
Vals 5 - 1
Vals 6 - 0
Vals 7 - 0
Total Acres - 14
Potential MBF - 353
Quarter Quad - KINGSKE
VCU Number - 744
Photo Number - 1890-6
Alternative Pattern - 200560

★ Landing

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 90 **Planned Acres:** 10.2 **Estimated Volume:** 208.9 **In Alternatives:** 2 , 0 , 0 , 0 , 7
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC5NE **Photo:** 1890-2 **Logging systems:** - RS- HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D58A **WAA Number:** 510 **NOI Unit:** 534 **Original LSTA Unit:** 744-534

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 6.4 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** E
Volume class breakdown: Class 4: 6.4 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 3.8
Visuals: Seen 10.2 Not Seen 0.0 **VQOs:** PR- 0.0 MM- 10.2 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 10.2 **Low VAC** 0.0 **Roadless** 10.2
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.6 Soils: 0.0
Mass movement Index: Low 10.2 Medium 0.0 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 7.9 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 10.2 3- 0.0 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 10.2
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit consists mainly of forested wetlands (BMP 12.5). Recommend at least partial log suspension when yarding (BMP 13.9). NRB 9/21/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations.

Engineering Input
There are no engineering mitigation measures anticipated for this unit.

Fish/Watershed Input
No concerns. NRB 9/21/95

Wildlife Input
Harvest operations restricted to April 1 to October 31 to protect trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit may be seen from Carroll Inlet. Identified VQO is modification. Beach and estuary buffers will help screen unit. WEA 9/30/95

Lands Input
No concerns. NRB 9/21/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

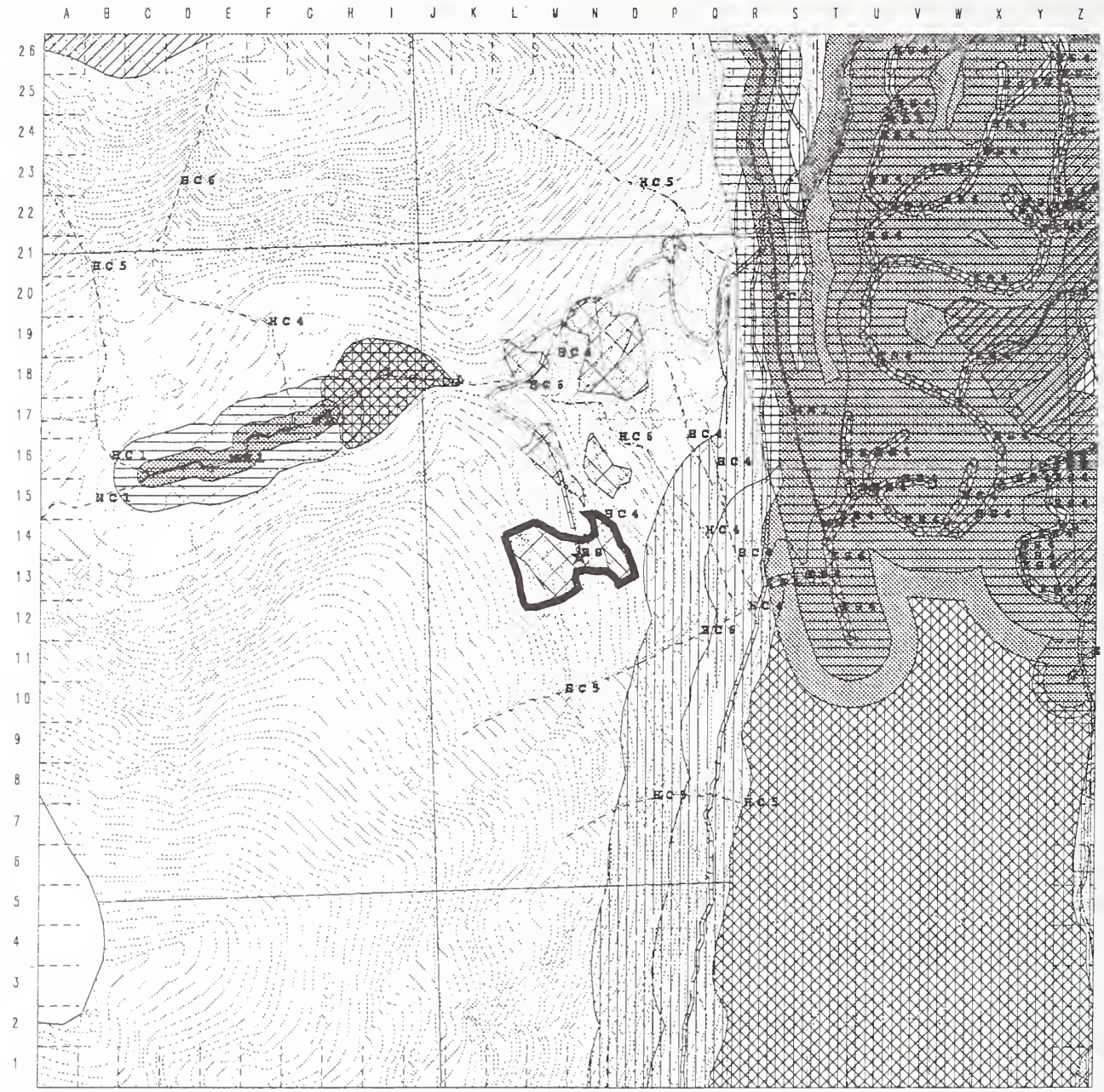
Geological Input
No concerns. NRB 9/21/95

Silviculture Input
This unit has high volume, with small areas of Hydric soils. Monitor.

Upper Carroll Study Area Unit Schematic - Final Unit 90

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

- Class 1 Stream
- Class 2 Stream
- Class 3 Stream
- Section Line
- Blooming Roads
- Unit Boundary
- Setting Line
- Contour or Ortho Line
- Beach or Estuary Buffer
- Private Land
- Implementation Buffer
- Anadromous 300 ft. Buffer
- Body of Water
- Prior Harvest
- Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Stack Line
SH Shovel Yarding

Volc 4 - 6
Volc 5 - 0
Volc 6 - 0
Volc 7 - 0
Total Acres - 10
Potential MBF - 209
Quarter Quad - K1NC5NE
VCU Number - 744
Photo Number - 1890-2
Alternative Pattern - 20007
★ Landing

Feet

0 526 1056 1582 2112

Projection - Stateplane

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 92 **Planned Acres:** 66.5 **Estimated Volume:** 1,950.4 **In Alternatives:** 2 , 0 , 0 , 0 , 0
Silvicultural System : See section **Number of Settings:** 7 **Quad:** KTND5SE **Photo:** 1890-186 **Logging systems:** - RS- SH
Management Area: K32 **VCU Number:** 737 **Watershed Code:** C41B **WAA Number:** 510 **NOI Unit:** 547 **Original LSTA Unit:** 737-547

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 66.5 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** NW
Volume class breakdown: Class 4: 49.0 Class 5: 17.4 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 0.0 Not Seen 66.5 **VQOs:** PR- 0.0 MM- 0.0 M- 66.5 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 66.5 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 2.8
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 3.3 Soils: 0.0
Mass movement Index: Low 24.5 Medium 37.6 High 4.3 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 18.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 24.5 2- 0.0 3- 41.9 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 62.4
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
The east-central (N-13) part of this unit contains some high landslide potential soils, MMI=3 (BMP 13.5). There are some forested wetlands in the western part of the unit (L-13 to 15) (BMP 12.5). Recommend at least partial log suspension when yarding these areas (BMP 13.9). Avoid road location on wetlands, if possible (BMP 14.3). NRB 9/21/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. Oversteepened slopes may require full bench construction and endhaul of waste. (BMP 14.7)

Fish/Watershed Input
Class III AF1 stream west: Split yarding and full suspension requiredr (BMP 13.9).
Class II MM2 stream north (TTRA): 120 foot no cut buffer (BMP 12.6,12.6a).
Class III HC5 stream east: 75 foot sideslope buffer (12.6, 12.6a).

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 9/21/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
No concerns. NRB 9/21/95

Silviculture Input
Moderate productivity with areas of mass movement and Hydric soils that will need to be planted. (12 acres) Unit boundary should abut adjacent second growth unit to avoid isolating small patches of timber. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 92

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /1st1les/rel/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Statepl ane

Vole 4 - 49
Vole 5 - 17
Vole 6 - 0
Vole 7 - 0
Total Acres - 66
Potential MBF - 1950
Quarter Quad - KINDSSE
VCU Number - 737
Photo Number - 1890-186
Alternative Pattern - 20000

★ Landing

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 93 **Planned Acres:** 41.4 **Estimated Volume:** 1,329.8 **In Alternatives:** 2 , 0 , 0 , 0 , 0
Silvicultural System : See section **Number of Settings:** 4 **Quad:** KTND5SE **Photo:** 1890-198 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 737 **Watershed Code:** C41B **WAA Number:** 510 **NOI Unit:** 572 **Original LSTA Unit:** 737-572

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 40.6 Spruce 0.0 Mixed Hem/Spr 0.5 **Nonforested** 0.0 **Aspect:** SW
Volume class breakdown: Class 4: 11.1 Class 5: 29.4 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.3
Visuals: Seen 0.0 Not Seen 41.4 **VQOs:** PR- 0.0 MM- 0.0 M- 41.4 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 41.4 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 1.9
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.1 Class 3 Stream: 0.8 Soils: 0.0
Mass movement Index: Low 0.1 Medium 36.4 High 4.5 Very High 0.4 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 5.5 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.1 2- 0.0 3- 0.0 4- 41.3
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 39.5
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Part of this harvest unit (O-12) consists of very high landslide potential soils, MMI=4 (BMP 13.5). Vertical rock cliffs are common in this area. Recommend that this area be deleted from the proposed unit. Forested wetlands are located along the west unit boundary (K-15 to O-11) (BMP 12.5). Recommend at least partial log suspension be achieved when yarding these wetlands (BMP 13.9). Construction of the road segement through setting 4 will require some full-bench design (BMP 14.7). Waste material should be end-hauled and deposited on a stable site (BMP 14.12). NRB 9/21/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Northeastern portion of planned unit appears to be a blindlead. South portion of planned unit is across a large Class II stream which will require a 100' buffer. Full suspension is required (need Stream Protection Plan). Verify feasibility of retaining Southernmost portion of planned unit or modify unit boundaries as required.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. Oversteepened slopes may require full bench construction and endhaul of waste . (BMP 14.7)

Fish/Watershed Input
Class III HC5 stream east boundary: 75 foot sideslope buffer (BMP 12.6, 12.6a)
Class III PA1 stream southwest: split yarding or full suspension required (BMP 13.16, 13.9).
Field reconnaissance verified that the PA1 stream is a Class III and not Class I as indicated on the current GIS layer.

Wildlife Input
No wildlife mitigation required. Snag distribution concerns were addressed between the Draft and Final EIS. Snag distribution is maintained by bropping the south end of the unit. Leave islands are compatible with logging systems and safe working conditions.

Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 9/21/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

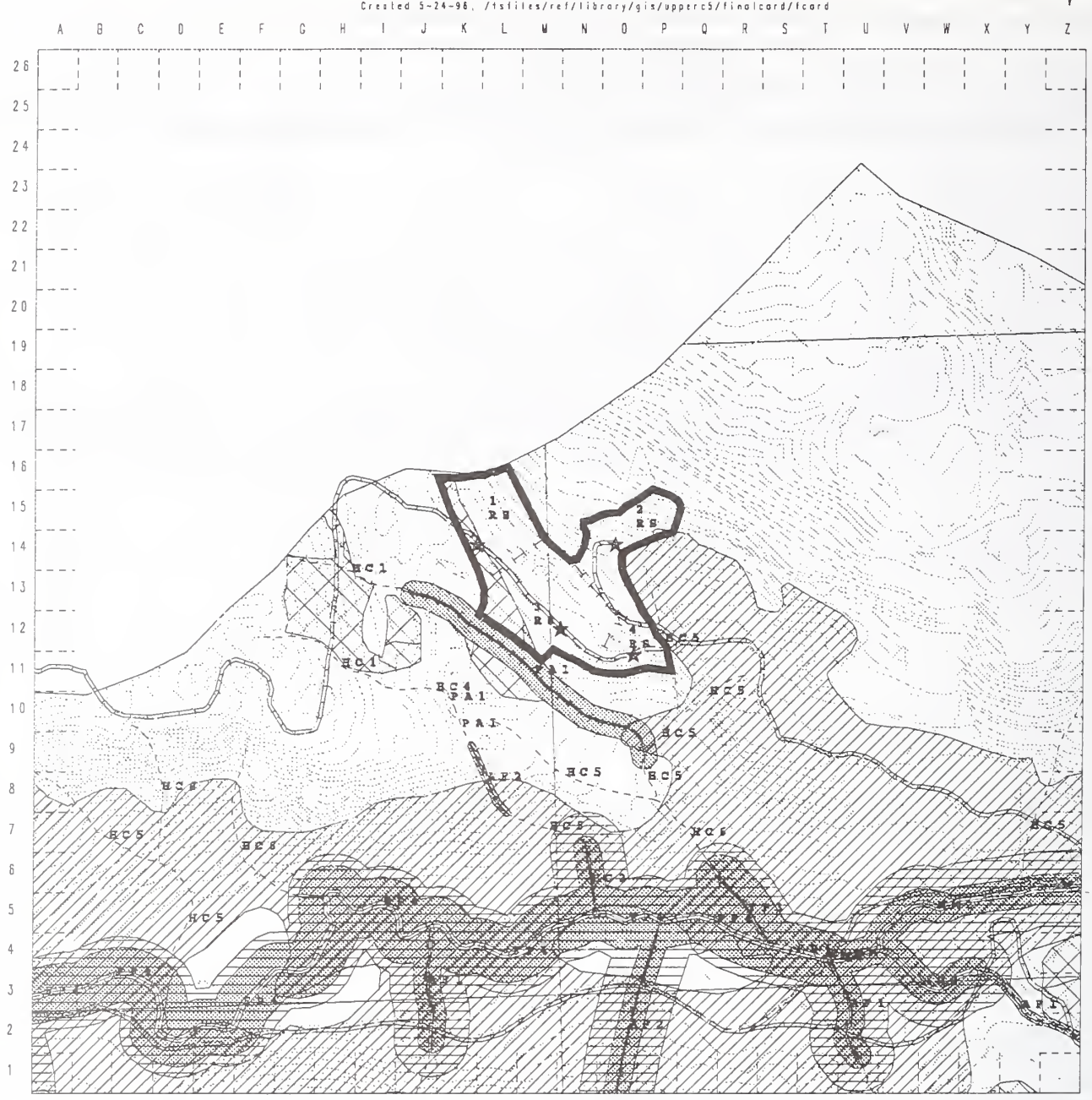
Geological Input
No concerns. NRB 9/21/95

Silviculture Input
High productivity with small areas of high elevation and high mass movement soils. Planting will be required, using Alaska yellow cedar if available (8 acres). Unit should abut adjacent second growth to avoid isolating small wind-prone patches of standing timber. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 93

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /tsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vole 4 - 11
Vole 5 - 29
Vole 6 - 0
Vole 7 - 0
Total Acres - 41
Potential MBF - 1330
Quarter Quad - KINOSSE
VCU Number - 737
Photo Number - 1890-198
Alternative Pattern - 20000

★ Landing

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 95 **Planned Acres:** 19.6 **Estimated Volume:** 528.6 **In Alternatives:** 2 , 0 , 0 , 0 , 0
Silvicultural System : See section **Number of Settings:** 2 **Quad:** KTND5SE **Photo:** 1890-65 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 733 **Watershed Code:** C41B **WAA Number:** 510 **NOI Unit:** 603 **Original LSTA Unit:** 733-603

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 19.1 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** E
Volume class breakdown: Class 4: 19.1 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.5
Visuals: Seen 0.0 Not Seen 19.6 **VQOs:** PR- 0.0 MM- 0.0 M- 19.6 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 19.6 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 14.7
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 5.5 Soils: 0.0
Mass movement Index: Low 1.5 Medium 18.0 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 15.5 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 1.5 2- 0.0 3- 18.0 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 19.4
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit consists mostly of forested wetlands (BMP 12.5). Recommend at least partial log suspension during yarding to minimize disruption of wetland functions (BMP 13.9). NRB 9/21/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. Oversteepened slopes may require full bench construction and endhaul of waste. (BMP 14.7)

Fish/Watershed Input
Class III HC1 stream south: sideslope buffer (BMP 12.6,12.6a)
Class III HC1 stream north: split yarding or full suspension required (BMP 1 3.16, 13.9).

Wildlife Input
Maintain distribution of snags by leaving 1-5 acre-sized islands of green trees at a rate of 1 acre of island for every 20 acres of harvest. Leave islands must be compatible with logging systems and safe working conditions.

Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 9/21/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

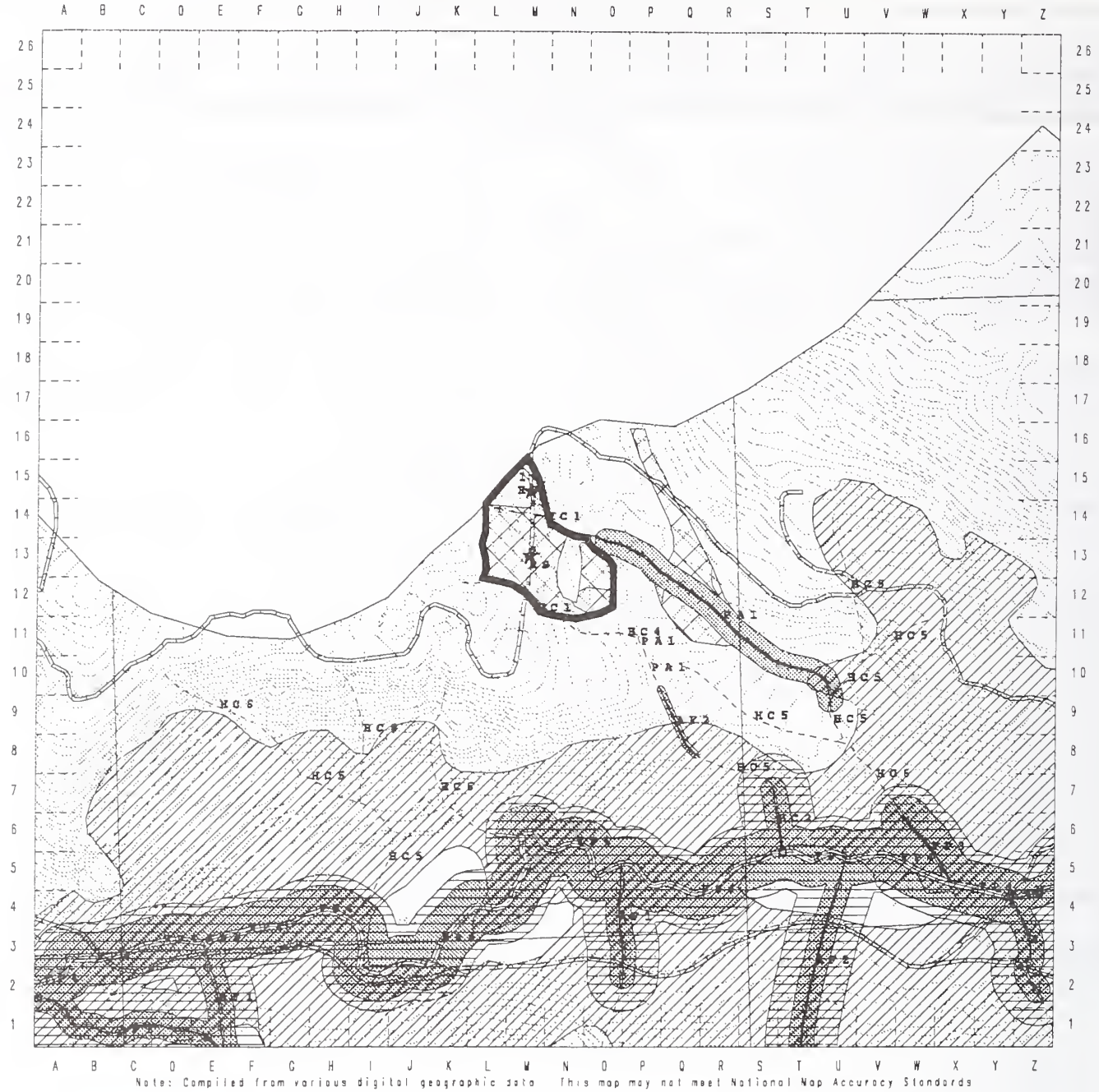
Geological Input
No concerns. NRB 9/21/95

Silviculture Input
Moderate productivity with small areas of Hydric soils that will need to be planted. (3 acres) CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 95

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /1stiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 330 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vols 4 - 19
Vols 5 - 0
Vols 6 - 0
Vols 7 - 0
Total Acres - 20
Potential MBF - 529
Quarter Quad - KINOSSE
VCU Number - 733
Photo Number - 1890-95
Alternative Pattern - 20000

★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet
0 526 1055 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 97 **Planned Acres:** 18.6 **Estimated Volume:** 642.0 **In Alternatives:** 2 , 0 , 5 , 0 , 0
Silvicultural System : See section **Number of Settings:** 3 **Quad:** KTND5SE **Photo:** 1890-65 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 737 **Watershed Code:** C43A **WAA Number:** 510 **NOI Unit:** 620 **Original LSTA Unit:** 737-620

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 18.6 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** N
Volume class breakdown: Class 4: 0.0 Class 5: 18.6 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 18.6 Not Seen 0.0 **VQOs:** PR- 0.0 MM- 0.0 M- 18.6 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** SPNM **High VAC** 0.0 **Intermediate VAC** 11.4 **Low VAC** 7.2 **Roadless** 18.6
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 8.4 Soils: 0.0
Mass movement Index: Low 0.0 Medium 10.8 High 7.8 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 1.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 18.5 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 0.0
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Much of this unit consists of high landslide potential, MMI=3, soils (BMP 13.5). Recommend at least partial log suspension when yarding (BMP 13.9). Road construction will require some full bench design (BMP 14.7). Waste material should be end-hauled and disposed of on a stable site (BMP 14.12). NRB 9/21/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Full suspension over Class III Stream required in center of unit; verify feasibility or locate temp road.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. Oversteepened slopes may require full bench construction and endhaul of waste. (BMP 14.17)

Fish/Watershed Input
Four water quality streams are located in this unit (BMP 12.6a). SPL 1/3/95 Recommend that yarding be split on these streams and that full log suspension be maintained when yarding across the stream (BMP 13.9), trees be felled away from the stream-course and slash be removed within 48 hours (BMP 13.16). Variable width slope-break buffers may also be required (BMP 12.6a) NRB 9/18/95

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
Unit may be seen from Neets Bay. Identified VQO is modification. Topographic features and adjacent standing timber will help screen unit. WEA 9/30/95

Lands Input
No concerns. NRB 9/21/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

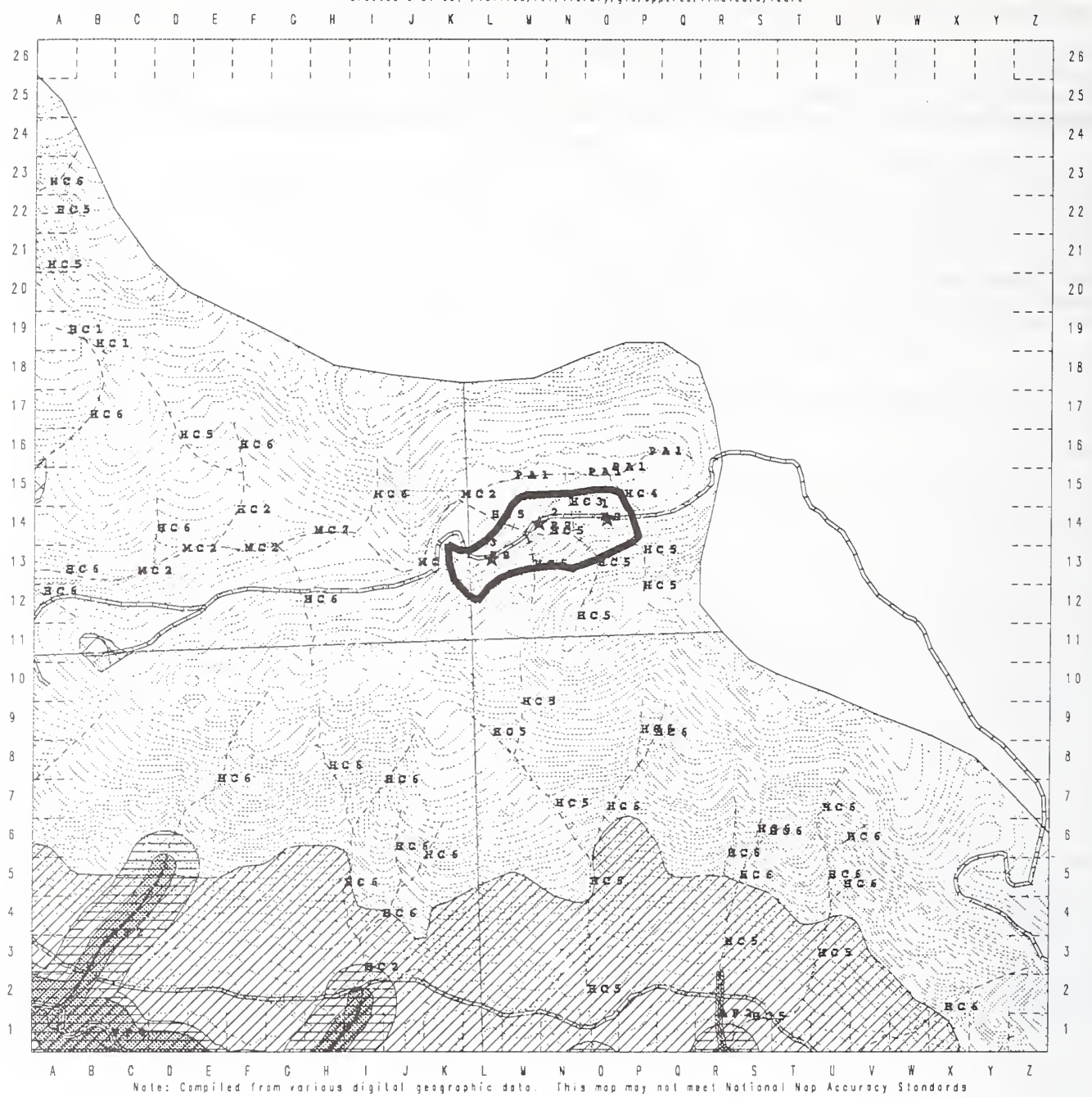
Geological Input
No concerns. NRB 9/21/95

Silviculture Input
High productivity with small areas of high elevation and high mass movement soils. Planting will be required, using high elevation Sitka spruce or Alaska yellow cedar if available. (3 acres) CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 97

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96. /1stfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vole 4 - 0
Vole 5 - 19
Vole 6 - 0
Vole 7 - 0
Total Acres - 19
Potential MBF - 642
Quarter Quad - KINOSSE
VCU Number - 737
Photo Number - 1890-65
Alternative Pattern - 20050
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet
0 525 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 98 **Planned Acres:** 26.5 **Estimated Volume:** 915.3 **In Alternatives:** 2 , 0 , 5 , 0 , 0
Silvicultural System : See section **Number of Settings:** 2 **Quad:** KTND5SE **Photo:** 1790-64 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 737 **Watershed Code:** C43A **WAA Number:** 510 **NOI Unit:** 622 **Original LSTA Unit:** 737-622

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 26.5 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** NW
Volume class breakdown: Class 4: 0.0 Class 5: 26.5 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 26.5 Not Seen 0.0 **VQOs:** PR- 0.0 MM- 0.0 M- 26.5 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** SPNM **High VAC** 0.0 **Intermediate VAC** 26.5 **Low VAC** 0.0 **Roadless** 26.5
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 3.1 Soils: 0.0
Mass movement Index: Low 0.0 Medium 15.4 High 11.1 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information. Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 26.0 4- 0.5
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 1.0
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Much of this harvest unit consists of high landslide potential, MMI=3, soils (BMP 13.5). Recommend at least partial log suspension when yarding (BMP 13.9). Road construction will require some full-bench design (BMP 14.7). Waste material should be disposed at some stable site down the road (BMP 14.12). NRB 9/21/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations.

Engineering Input
High MMi soils. Road constuction must minimize landslide potential. Oversteepened slopes may require full bench construction and endhaul of waste. (BMP 14.7)

Fish/Watershed Input
At least two water quality streams are located in this unit (BMP 12.6a). SPL 1/3/95 Recommend that yarding be split on these streams and that full log suspension be maintained when yarding across the stream (BMP 13.9), trees be felled away from the stream-course and slash be removed within 48 hours (BMP 13.16). Variable width, wind-firm slope-break buffers should be maintained within V-notches (BMP 12.6a) NRB 9/21/95

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
Unit may be visable from Neets Bay. identified VQO is modification. WEA 9/30/95

Lands Input
No concerns. NRB 9/21/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

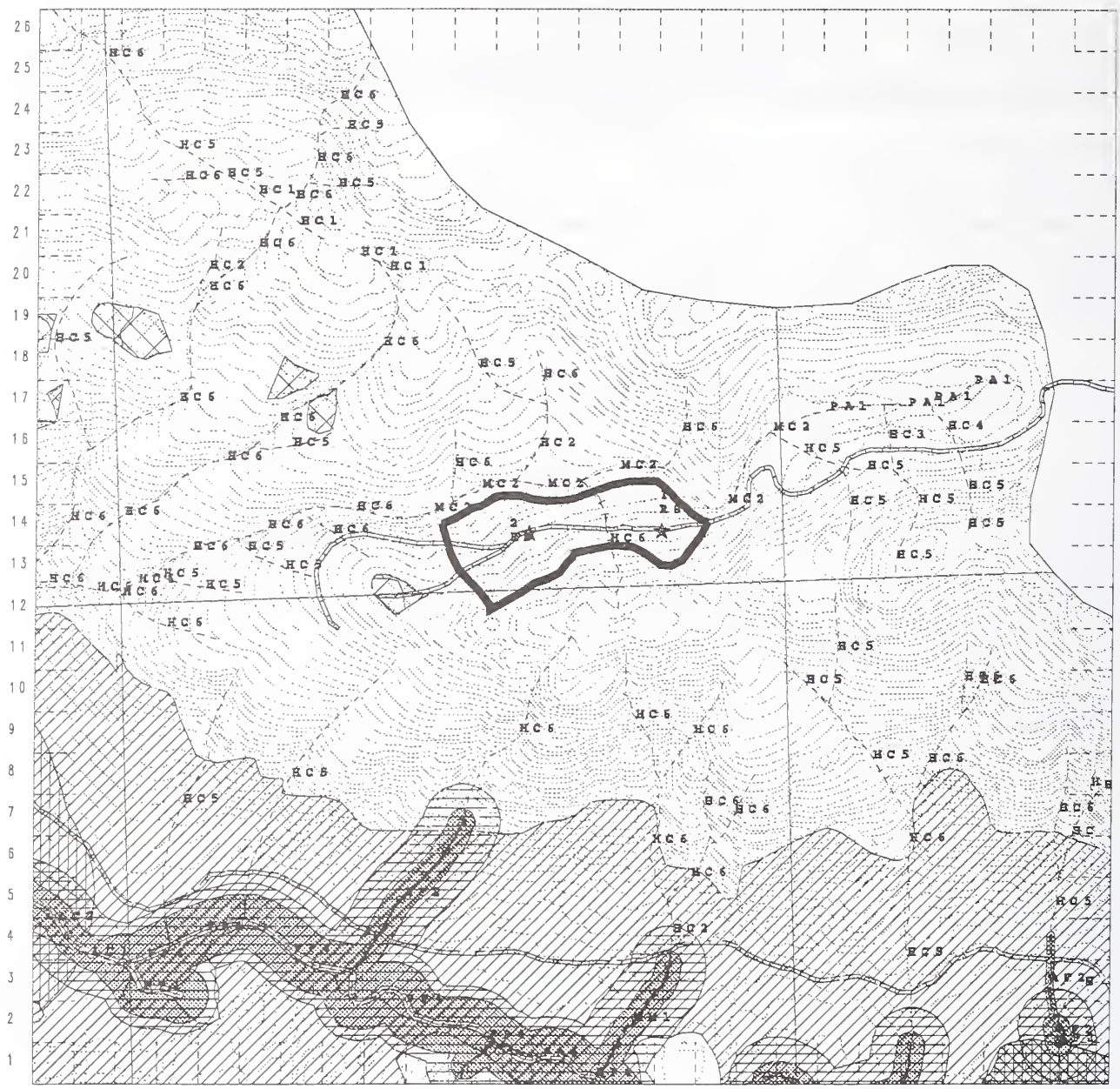
Geological Input
Two V-notches are located in this unit. For location and management recommendations, see FISH/WATERSHED INPUT above. NRB 9/21/95

Silviculture Input
High productivity with small areas of high elevation and high mass movement soils. Planting will be required, using high elevation Sitka spruce or Alaska yellow cedar if available. (3 acres) Consideration should be given to a diameter limit cut leaving all trees 13" DBH and under standing if helicopter yarded. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 98

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /isfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream

Class 2 Stream

Class 3 Stream

Section Line

Planning Roads

Unit Boundary

Setting Line

Contour or Ortho Line

Beach or Estuary Buffer

Private Land

Implementation Buffer

Anadromous 300 ft. Buffer

Body of Water

Prior Harvest

Updates to Wetlands

LOGGING SYSTEMS Abbrev.

RS Running Skyline

HE Helicopter

HL High Lead

SL Slack Line

SH Shovel Yarding

Projection - Stateplane

Volc 4 - 0

Volc 5 - 26

Volc 6 - 0

Volc 7 - 0

Total Acres - 27

Potential MBF - 915

Quarter Quad - KINOSSE

VCU Number - 737

Photo Number - 1790-64

Alternative Pattern - 20050

★ Landing

Feet

0 526 1055 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 104 **Planned Acres:** 26.0 **Estimated Volume:** 886.5 **In Alternatives:** 2 , 0 , 5 , 0 , 0
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTND5SE **Photo:** 1790-35 **Logging systems:** - HE
Management Area: K32 **VCU Number:** 737 **Watershed Code:** BW13 **WAA Number:** 510 **NOI Unit:** 638 **Original LSTA Unit:** 737-638

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 26.0 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** SW
Volume class breakdown: Class 4: 1.5 Class 5: 24.5 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 26.0 Not Seen 0.0 **VQOs:** PR- 26.0 MM- 0.0 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 0.4 **Low VAC** 25.6 **Roadless** 5.2
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.7 Soils: 0.0
Mass movement Index: Low 0.1 Medium 13.9 High 12.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.1 3- 0.1 4- 25.7
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 11.0
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Upper slopes in this unit (L-15 to O-14) are extremely steep. Recommend full suspension to minimize surface disturbance and landslide potential (BMP 13.9), helicopter yarding will provide this. V-notch along south unit boundary (K-13 to M-13). Recommend a wind-firm buffer be placed along the north side of this V-notch (BMPs 12.6a, 13.5 and 13.16) NRB 8/9/95

Timber Input
Planned logging systems design for this unit is Helicopter.

Engineering Input
There are no engineering mitigation measures anticipated for this unit.

Fish/Watershed Input
Class III HC6 stream east: sideslope buffer required (BMP 12.6).

Wildlife Input
Harvest operations restricted to April 1 to October 31 to avoid trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit may be seen from Neets Bay. Identified VQO is partial retention. Standing adjacent timber and shelterwood harvest will help to mollify visual impact. WEA 9/30/95

Lands Input
Unit is uphill from SSRAA facilities at net pens at Neets Bay. Helicopter yarding may take place over these facilities. SSRAA administrators should be advised when logging takes place. NRB 8/9/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

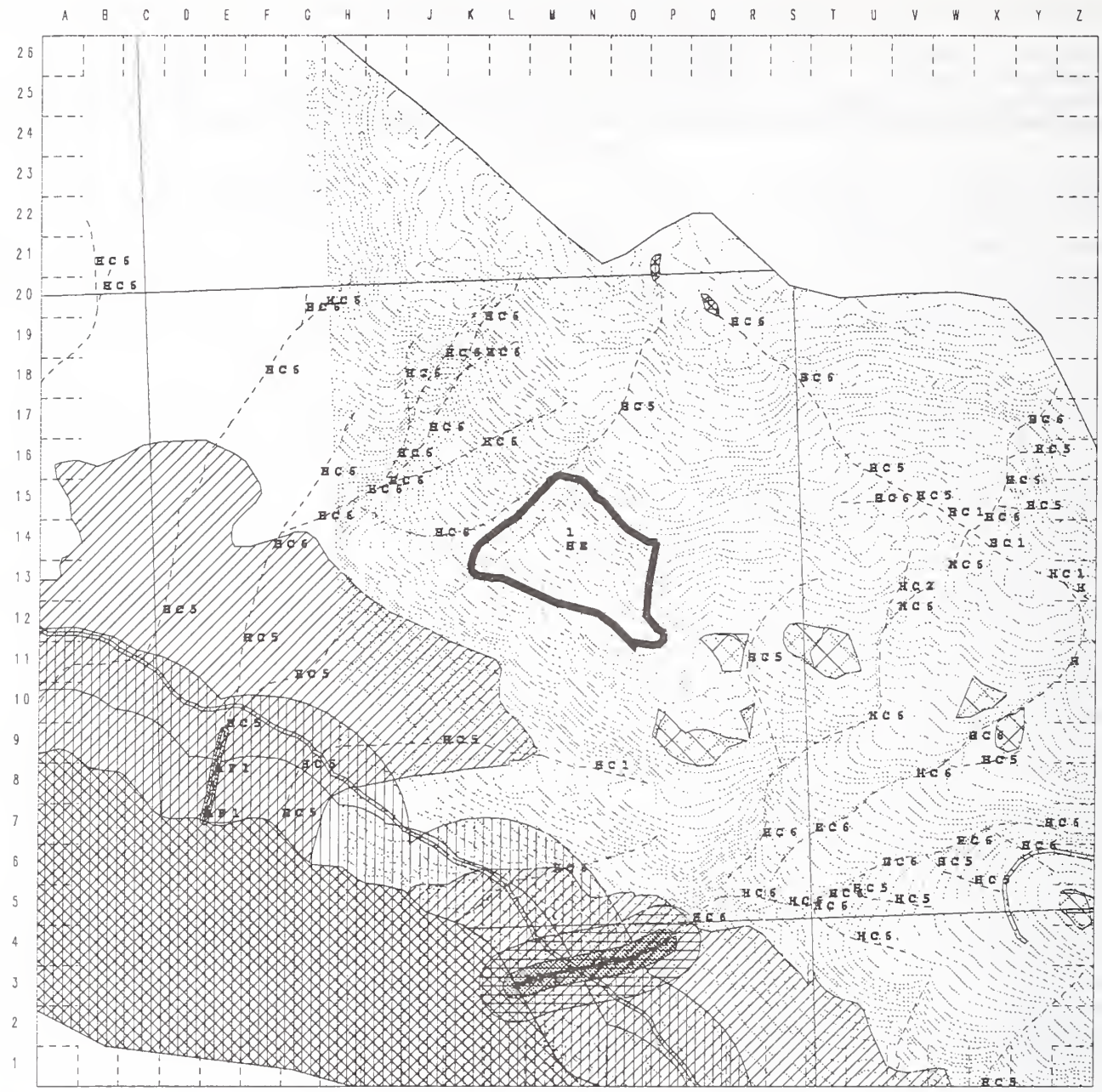
Geological Input
V-notch adjacent to unit. See soils input. NRB 8/9/95

Silviculture Input
High productivity with small areas of high elevation and high mass movement soils. Apply shelterwood harvest system leaving all trees 13" DBH and under standing. CBG 10/17/95.

Upper Carroll Study Area Unit Schematic - Final Unit 104

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-95, /tsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 330 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Stack Line
SH Shovel Yarding

Projection - Stateplane

Vols 4 - 1
Vols 5 - 24
Vols 6 - 0
Vols 7 - 0
Total Acres - 26
Potential MBF - 887
Quarter Quad - KINOSSE
VCU Number - 737
Photo Number - 1790-35
Alternative Pattern - 20050

★ Landing

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 106 **Planned Acres:** 43.4 **Estimated Volume:** 1,467.4 **In Alternatives:** 2 , 0 , 5 , 0 , 0
Silvicultural System : See section **Number of Settings:** 6 **Quad:** KTND5SE **Photo:** 1790-64 **Logging systems:** - RS- LS
Management Area: K32 **VCU Number:** 737 **Watershed Code:** C41B **WAA Number:** 510 **NOI Unit:** 643 **Original LSTA Unit:** 737-643

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 43.4 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** SW
Volume class breakdown: Class 4: 4.6 Class 5: 38.9 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 43.4 Not Seen 0.0 **VQOs:** PR- 1.8 MM- 0.0 M- 41.6 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 41.5 **Low VAC** 2.0 **Roadless** 21.8
Riparian MA: **Class 1 Stream:** 0.0 **Class 2 Stream:** 0.0 **Class 3 Stream:** 13.5 **Soils:** 16.3
Mass movement Index: Low 0.0 Medium 18.7 High 24.8 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 1.8 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 27.1 4- 16.3
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 1.3 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 25.5
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Consists of high landslide potential soils, MMI=3. Recommend at least partial log suspension in yarding (BMP 13.9). Unit contains shallow soils, high occurance of blowdown. Do not recommend this unit for any type of partial cut due to blowdown potential. NRB 8/9/95

Timber Input
Planned logging systems design for this unit is Running Skyline, Live Skyline and Slackline. Confirm final road and landing locations. Northern portion of planned unit appears to be a blindlead. Recommend moving road down to slope break in Northernmost part of unit and continuing road around midslope and ending at M13. Southern portion of unit also appears to have a blindlead. Run profiles to establish South, Southwest unit boundaries.

Engineering Input
High mass movement index soils. Road construction must minimize landslide potential (BMP 14.7) Oversteepened slopes may require full bench construction and endhaul of waste (BMP 14.7)

Fish/Watershed Input
Class III HC6 stream north: sideslope buffer (BMP 12.6, 12.6a).
Class III HC6 streams southwest, northeast: split yarding and full suspension required (BMP 13.9, 13.16).
Class III HC5 streams north central: split yarding and full suspension required (BMP 13.9< 13.16).

Wildlife Input
Harvest operations restricted to April 1 to October 31 to avoid trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit may be seen from Neets Bay. Identified VQO is modification. WEA 9/30/95

Lands Input
No concerns. NRB 8/9/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

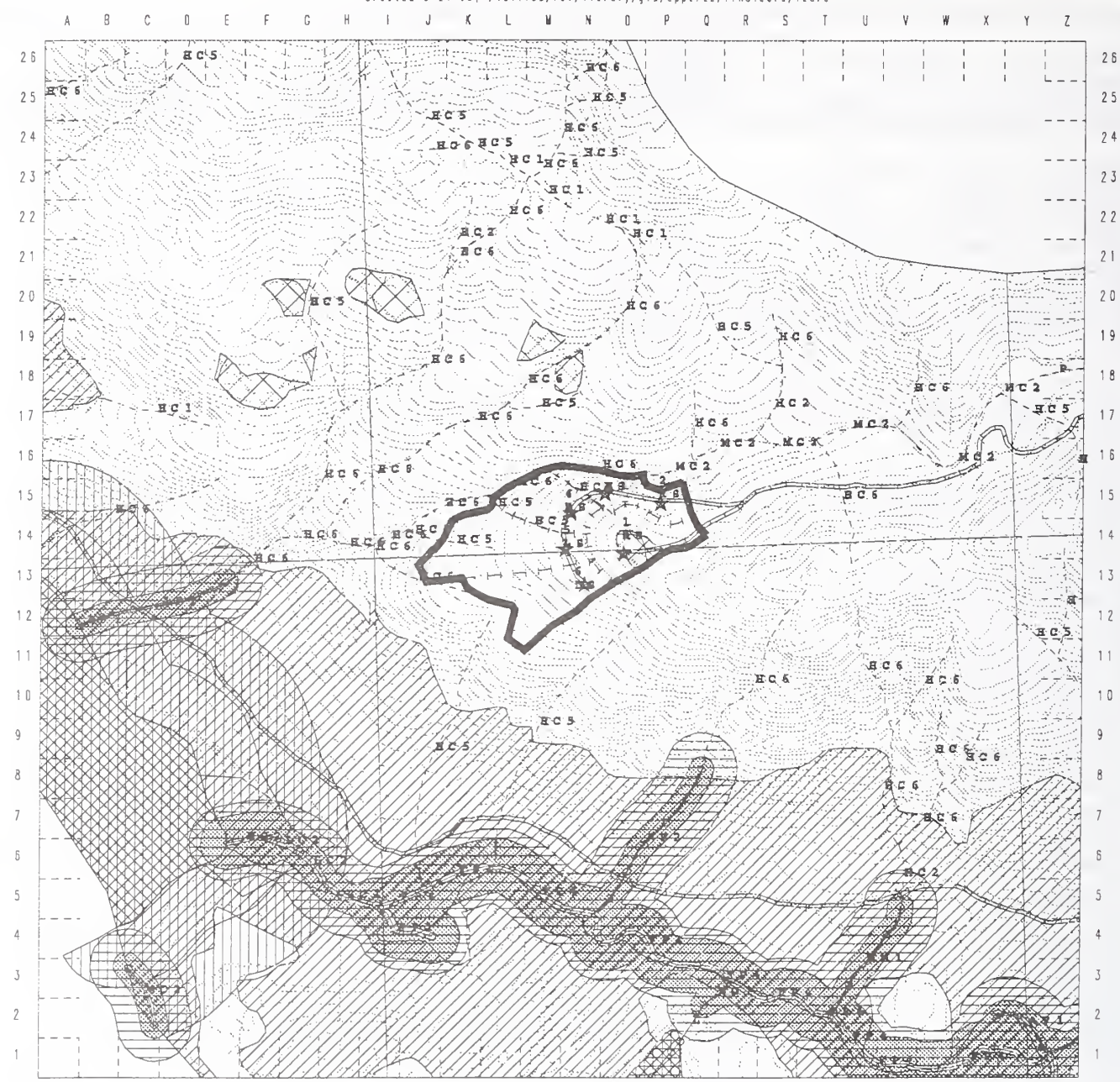
Geological Input
Deep V-notch along north side of unit (I-14 to P-16). Recommend windfirm buffer to protect V-notch (BMPs 12.6a, 13.5 and 13.16). NRB 8/9/95

Silviculture Input
Highly productive with small areas of high elevation and high mass movement soils. Planting will be required, using high elevation Sitka spruce or Alaska yellow cedar if available. (10 acres) CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 106

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implamentation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Volc 4 - 5
Volc 5 - 39
Volc 6 - 0
Volc 7 - 0
Total Acres - 43
Potential MBF - 1467
Quarter Quad - K1N05SE
VCU Number - 737
Photo Number - 1790-64
Alternative Pattern - 20050

★ Landing

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 107 **Planned Acres:** 22.7 **Estimated Volume:** 759.7 **In Alternatives:** 2 , 0 , 5 , 0 , 0
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTND5SE **Photo:** 1790-64 **Logging systems:** - HE
Management Area: K32 **VCU Number:** 737 **Watershed Code:** C43A **WAA Number:** 510 **NOI Unit:** 644 **Original LSTA Unit:** 737-644

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 22.4 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** SW
Volume class breakdown: Class 4: 2.3 Class 5: 20.1 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.3
Visuals: Seen 22.7 Not Seen 0.0 **VQOs:** PR- 0.0 MM- 0.0 M- 22.7 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** SPNM **High VAC** 0.0 **Intermediate VAC** 22.7 **Low VAC** 0.0 **Roadless** 22.7
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 8.9 Soils: 0.0
Mass movement Index: Low 0.0 Medium 14.9 High 7.8 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 3.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 18.7 4- 4.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 9.9
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Much of this unit is made up of high landslide potential soils, MMI=3. Helicopter yarding will provide full suspension over these soils (BMP 13.9)

Timber Input
Planned logging systems design for this unit is Helicopter.

Engineering Input
There are no engineering mitigation measures anticipated for this unit.

Fish/Watershed Input
Two water quality streams flow through the middle of this unit (BMP 12.6a). SPL 1/3/95 Recommend that yarding be split on these streams and that full log suspension be maintained when yarding across the stream (BMP 13.9), trees be felled away from the stream-course and slash be removed within 48 hours (BMP 13.16). Variable width slope-break buffers may also be required (BMP 12.6a) NRB 9/18/95

Wildlife Input
Harvest operations restricted to April 1 to October 31 if logs are dropped in saltwater, to avoid trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Units may be seen from Neets Bay. Identified VQO is modification. Adjacent uncut timber and shelterwood harvest will help screen unit. WEA 9/30/95

Lands Input
Unit located uphill from SSRAA facilities at Neets Bay. Advise SSRAA administrators when logging is taking place. NRB 8/10/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
V-notch runs through middle of unit (N-15 to K-12). Recommend retention of a windfirm stand of trees within the V-notch (BMP 13.5) NRB 8/10/95

Silviculture Input
Moderate productivity with small areas of high elevation and high mass movement soils. Apply shelterwood harvest system leaving all trees 13" DBH and under standing. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 107

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fstiles/ref/library/gis/upperc5/finalcord/fcord



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

- Class 1 Stream
- Class 2 Stream
- Class 3 Stream
- Section Line
- Planning Roads
- Unit Boundary
- Setting Line
- Contour or Ortho Line
- Beach or Estuary Buffer
- Private Land
- Implementation Buffer
- Roadromous 300 ft. Buffer
- Body of Water
- Prior Harvest
- Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vole 4 - 2
Vole 5 - 20
Vole 6 - 0
Vole 7 - 0
Total Acres - 23
Potential MBF - 760
Quarter Quad - KINOSSE
VCU Number - 737
Photo Number - 1790-64
Alternative Pattern - 20050

★ Landing

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 110 **Planned Acres:** 17.0 **Estimated Volume:** 567.8 **In Alternatives:** 2 , 0 , 5 , 0 , 0
Silvicultural System : See section **Number of Settings:** 3 **Quad:** KTND5SW **Photo:** 1790-37 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 737 **Watershed Code:** BW8A **WAA Number:** 510 **NOI Unit:** 753 **Original LSTA Unit:** 737-753

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 16.2 Spruce 0.0 Mixed Hem/Spr 0.1 **Nonforested** 0.0 **Aspect:** S
Volume class breakdown: Class 4: 0.0 Class 5: 16.2 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.7
Visuals: Seen 5.5 Not Seen 11.5 **VQOs:** PR- 5.5 MM- 11.5 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 8.3 **Intermediate VAC** 0.0 **Low VAC** 8.7 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 3.0 Soils: 0.0
Mass movement Index: Low 11.4 Medium 5.6 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 2.2 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 11.4 3- 0.0 4- 5.6
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 13.3 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 13.3
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
East side of unit (O-13) contains about 4 acres of forested wetlands. Area looks to be suitable for shovel yarding (BMPs 12.5 and 13.9). No concerns on the rest of the unit. NRB 8/10/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations.

Engineering Input
There are no engineering mitigation measures anticipated for this unit.

Fish/Watershed Input
One water quality stream is located in this unit (BMP 12.6a). SPL 1/3/95 Recommend that yarding be split on these stream and that full log suspension be maintained when yarding across the stream (BMP 13.9), trees be felled away from the stream-course and slash be removed within 48 hours (BMP 13.16). Variable width slope-break buffers may also be required (BMP 12.6a) NRB 9/18/95

Wildlife Input
Harvest operations restricted to April 1 to October 31 to protect trumpeter swan resting/feeding areas.

Recreation / Visuals Input
A small portion of unit may be seen from Neets Bay. Identified VQO is maximum modification. WEA 9/30/95

Lands Input
No concerns. NRB 8/10/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

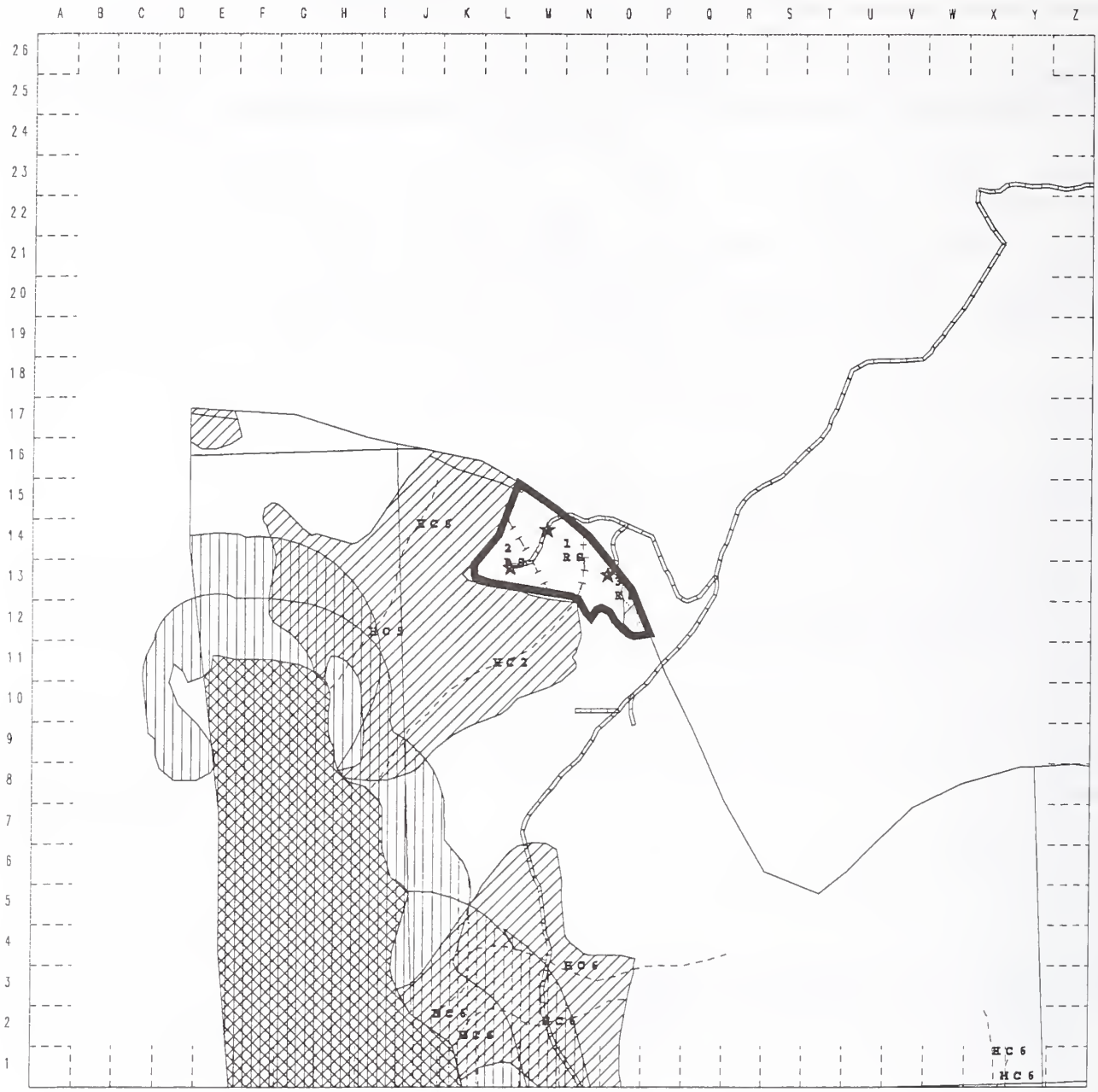
Geological Input
No concerns. NRB 8/10/95

Silviculture Input
Moderate productivity with small areas of Hydric soils that will need to be planted. (4 acres) CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 110

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96. /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 333 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vole 4 - 0
Vole 5 - 16
Vole 6 - 0
Vole 7 - 0
Total Acres - 17
Potential MBF - 568
Quarter Quad - KINO55W
VCU Number - 737
Photo Number - 1790-37
Alternative Pattern - 20050

★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet

0 525 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 111 **Planned Acres:** 7.8 **Estimated Volume:** 213.2 **In Alternatives:** 2 , 3 , 5 , 0 , 7
Silvicultural System : See section **Number of Settings:** 2 **Quad:** KTNC5SE **Photo:** 1390-23 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 746 **Watershed Code:** D79A **WAA Number:** 510 **NOI Unit:** 757 **Original LSTA Unit:** 746-757

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 7.8 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** E
Volume class breakdown: Class 4: 7.8 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 0.8 Not Seen 6.9 **VQOs:** PR- 0.0 MM- 6.9 M- 0.0 P- 0.0 R- 0.8
Recreation: **Primary ROS Code** RM **High VAC** 7.8 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 7.8 Medium 0.0 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 2.5 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 7.8 3- 0.0 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 7.3
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit consists of forested wetlands, low volume, mixed conifer stand. Suitable for shovel yarding (BMPs 12.5, 13.9).
NRB 8/10/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations.

Engineering Input
Coho/Pink/Chum timing (June 15 - August 7) may apply for all road construction and/or drainage installations.

Fish/Watershed Input
Class I FP3 stream south (TTRA): 200 foot no cut buffer (BMP 12.6,12.6a).
Class II HC2 stream northwest (TTRA): 100 foot no cut buffer (BMP 12.6, 12.6a).

Wildlife Input
No mitigation measures identified.

Recreation / Visuals Input
A small portion of unit may be seen. Identified VQO is maximum modification. WEA 9/30/95

Lands Input
No concerns. NRB 8/10/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

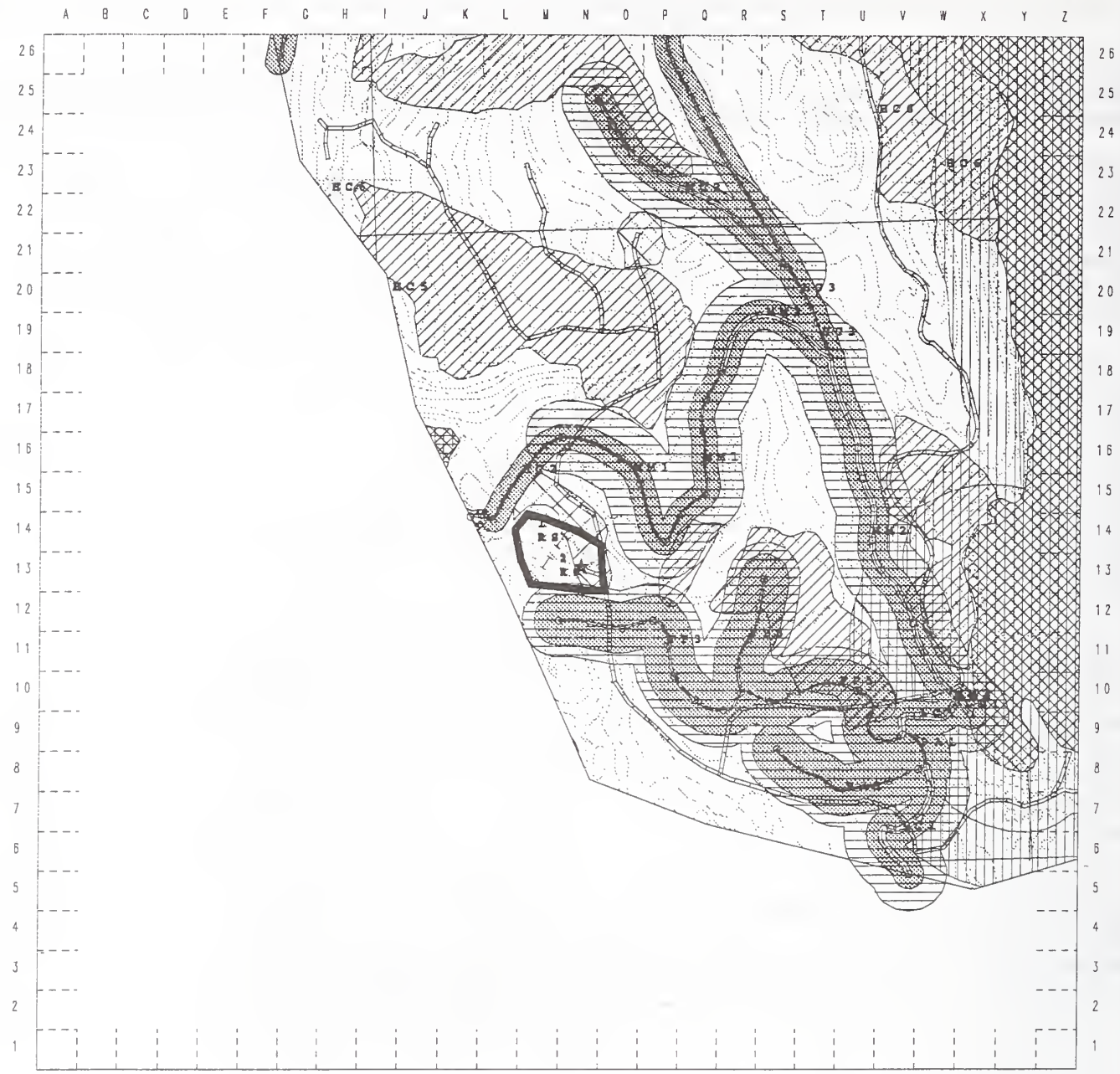
Geological Input
Carbonate rock has been found in the North Saddle Lakes area. If carbonate rock or karst features are found in this unit, follow Ketchikan Area cave management direction. NRB 8/10/95

Silviculture Input
Low productivity with areas of Hydric soils that will need to be planted. (3 acres). Consider deferring harvest.

Upper Carroll Study Area Unit Schematic - Final Unit 111

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Flooding Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Roadmouse 100 ft. Buffer
Body of Water
Prior Harvest
Updates to Matlaods

Vols 4 - 8
Vols 5 - 0
Vols 6 - 0
Vols 7 - 0
Total Acres - 8
Potential MBF - 213
Quarter Quad - KINC5SE
VCU Number - 746
Photo Number - 1390-23
Alternative Pattern - 23057
★ Landing

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet
0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 119 **Planned Acres:** 5.0 **Estimated Volume:** 137.2 **In Alternatives:** 2 , 3 , 0 , 0 , 7
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC5SE **Photo:** 1390-23 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 746 **Watershed Code:** D79A **WAA Number:** 510 **NOI Unit:** 776 **Original LSTA Unit:** 746-776

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 5.0 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** NE
Volume class breakdown: Class 4: 5.0 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 0.0 Not Seen 5.0 **VQOs:** PR- 0.0 MM- 5.0 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 5.0 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 5.0 Medium 0.0 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 3.3 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 5.0 3- 0.0 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 3.9 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 5.0
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit is made up of low volume western hemlock and mixed conifer plant series on poorly drained organic (wetland) soils (BMP 12.5). Recommend at least partial log suspension during yarding (BMP 13.9). Shovel logging would achieve this on much of this unit. NRB 8/10/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations.

Engineering Input
Coho/Pink/Chum timing (June 15 - August 7) may apply to all road construction and/or drainage installations.

Fish/Watershed Input
Class II MC2 stream northeast (TTRA): 100 foot no cut buffer (BMP 12.6, 12.6a).

Wildlife Input
No wildlife mitigation measures identified.
Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 8/10/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

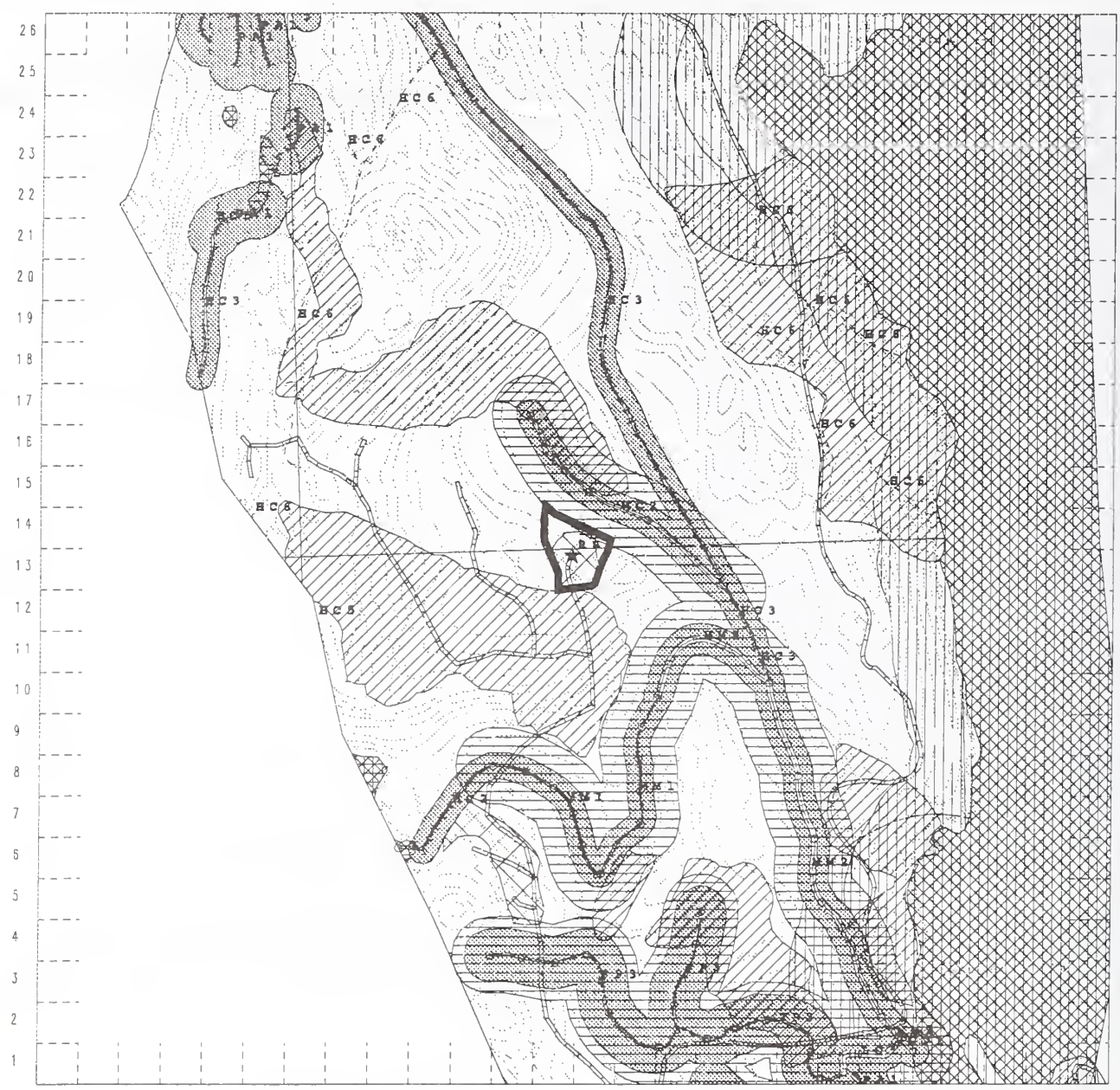
Geological Input
The North Saddle Lakes area is known to contain areas of carbonate rock and karst features. If karst features are identified during unit layout, follow Ketchikan Area cave management direction. NRB 8/10/95

Silviculture Input
Moderate productivity with small areas of Hydric soils that will need to be planted. (3 acres) Possible adjacency with NSL Unit 16, bringing total size of opening to 72 acres. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 119

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96. /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data this map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vole 4 - 5
Vole 5 - 0
Vole 6 - 0
Vole 7 - 0
Total Acres - 5
Potential WBF - 137
Quarter Quad - KINC5SE
VCU Number - 746
Photo Number - 1390-23
Alternative Pattern - 23007
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet
0 525 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 120 **Planned Acres:** 20.1 **Estimated Volume:** 605.5 **In Alternatives:** 2 , 3 , 0 , 0 , 7
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC5SE **Photo:** 1390-23 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 746 **Watershed Code:** D79A **WAA Number:** 510 **NOI Unit:** 779 **Original LSTA Unit:** 746-779

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 19.9 Spruce 0.0 Mixed Hem/Spr 0.3 **Nonforested** 0.0 **Aspect:** E
Volume class breakdown: Class 4: 11.7 Class 5: 8.1 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 9.5 Not Seen 10.6 **VQOs:** PR- 0.0 MM- 10.6 M- 9.5 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 14.0 **Intermediate VAC** 6.1 **Low VAC** 0.0 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 2.4 Medium 17.7 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 2.4 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 2.4 3- 0.0 4- 17.7
High Value Habitat: Sitka Black-Tail Deer- 0.1 Marten- 12.6 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 15.8
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
No concerns. NRB 8/24/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations.

Engineering Input
There are no engineering mitigation measures anticipated for this unit.

Fish/Watershed Input
One water quality stream flows through the middle of this unit (BMP 12.6a). SPL 1/3/95 Recommend that yarding be split on this stream and that full log suspension be maintained when yarding across the stream (BMP 13.9), trees be felled away from the stream-course and slash be removed within 48 hours (BMP 13.16). Variable width slope-break buffers may also be required (BMP 12.6a) NRB 8/24/95

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
Portion of unit may be seen from North Saddle lakes. Identified VQO is maximum modification. Analyze cumulative effects with shelter cove harvest. WEA 9/30/95

Lands Input
No concerns. NRB 8/10/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
The North Saddle Lakes area is known to contain some areas of carbonate rock and karst features. If karst features are identified during unit layout, follow Ketchikan Area cave management direction. NRB 8/10/95

Silviculture Input
Low productivity. Monitor regeneration to determine if planting will be necessary. Proposed unit location will create adjacency concern with NSL units 17 and 16 bringing total size of opening to 138 acres. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 120

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-98, /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 330 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vols 4 - 12
Vols 5 - 8
Vols 6 - 0
Vols 7 - 0
Total Acres - 20
Potential MBF - 805
Quarter Quad - KINC55E
VCU Number - 746
Photo Number - 1390-23
Alternative Pattern - 23007
★ Landing

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet
0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 121 **Planned Acres:** 5.0 **Estimated Volume:** 154.6 **In Alternatives:** 2 , 3 , 0 , 0 , 7
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC5SE **Photo:** 1390-23 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 746 **Watershed Code:** D79A **WAA Number:** 510 **NOI Unit:** 780 **Original LSTA Unit:** 746-780

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 4.3 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** W
Volume class breakdown: Class 4: 0.0 Class 5: 4.3 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.7
Visuals: Seen 5.1 Not Seen 0.0 **VQOs:** PR- 3.6 MM- 0.0 M- 0.0 P- 0.0 R- 1.5
Recreation: **Primary ROS Code** SPNM **High VAC** 2.1 **Intermediate VAC** 2.9 **Low VAC** 0.0 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.6 Soils: 0.0
Mass movement Index: Low 0.2 Medium 4.9 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.2 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.2 3- 0.0 4- 4.9
High Value Habitat: Sitka Black-Tail Deer- 3.8 Marten- 3.8 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 3.8
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
No concerns. NRB 8/24/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations.

Engineering Input
There are no engineering mitigation measures anticipated for this unit.

Fish/Watershed Input
No concerns. NRB 8/24/95

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
Unit can be seen from North Saddle lakes potential recreation site. Proposed VQO is partial retention.

Lands Input
No concerns. NRB 8/10/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
The North Saddle Lakes area is known to contain some carbonate rock and karst features. If karst features are identified during unit layout, follow Ketchikan Area cave management direction and guidelines. NRB 8/10/95

Silviculture Input
High productivity. Possible adjacency with NSL Unit 16 bringing total size of opening to 71 acres. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 121

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-98, /fstiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Volc 4 - 0
Volc 5 - 4
Volc 6 - 0
Volc 7 - 0
Total Acres - 5
Potential MBF - 155
Quarter Quad - K1NC5SE
VCU Number - 745
Photo Number - 1390-23
Alternative Pattern - 23007

★ Landing

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 125 **Planned Acres:** 3.1 **Estimated Volume:** 65.6 **In Alternatives:** 2 , 3 , 5 , 6 , 7
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC5SE **Photo:** 1390-23 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 746 **Watershed Code:** D79A **WAA Number:** 510 **NOI Unit:** 823 **Original LSTA Unit:** 746-823

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 2.1 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** E
Volume class breakdown: Class 4: 2.1 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 0.0 Not Seen 3.1 **VQOs:** PR- 0.0 MM- 3.1 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 3.1 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.3 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 3.1 Medium 0.0 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 3.1 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 3.1 3- 0.0 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 0.0
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit consists of forested wetlands, low volume, western hemlock and mixed conifer plant series on poorly drained, peat soils (BMP 12.5). Recommend shovel logging to provide full log suspension on this site. NRB 8/10/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations.

Engineering Input
Coho/Pink/Chum timing (June 15 - August 7) may apply for all road construction and/or drainage installations.

Fish/Watershed Input
Class I FP3 stream northeast (TTRA) : 200 foot no cut buffer (BMP 12.6, 12.6a).

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 8/10/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

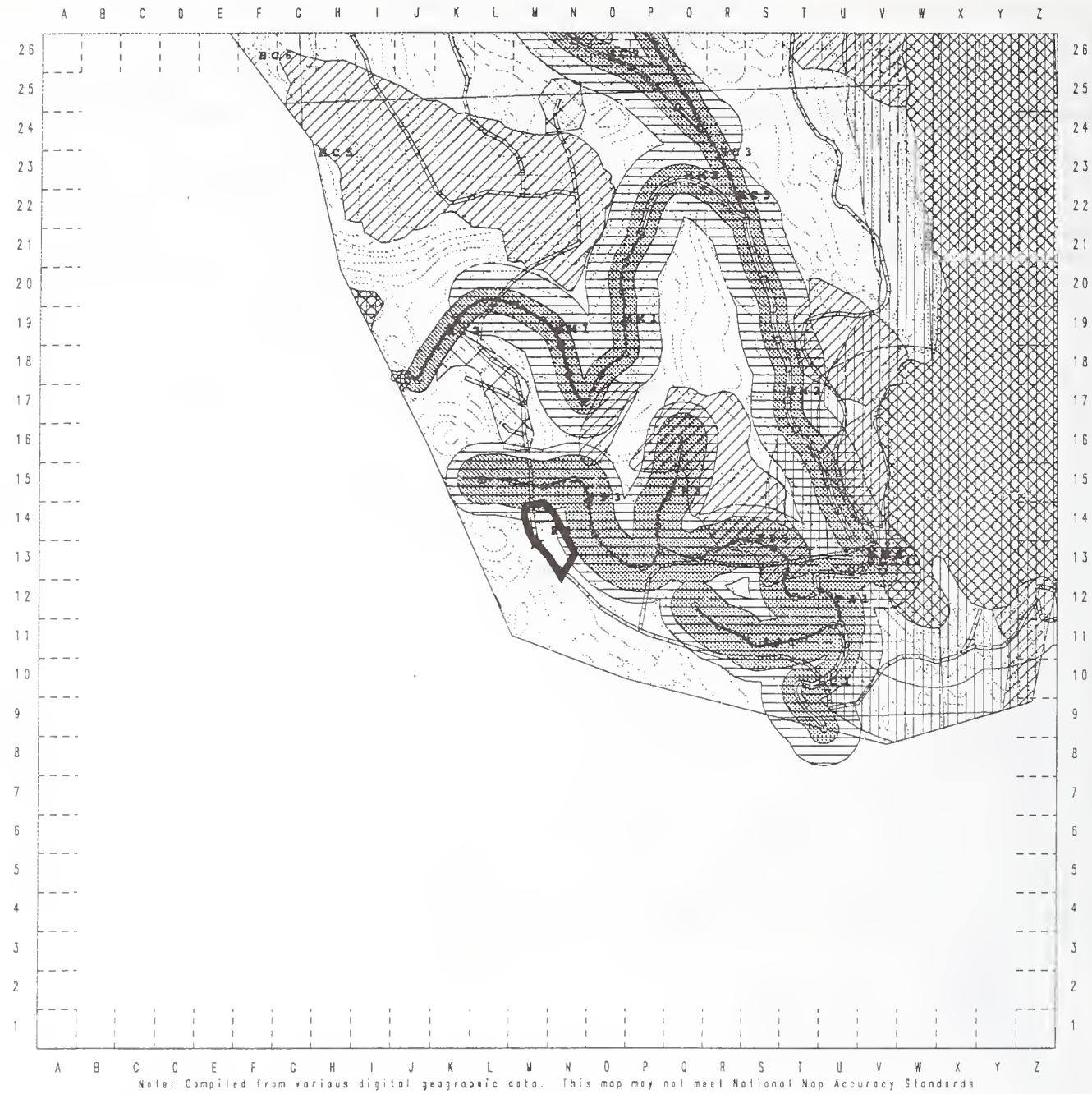
Geological Input
No concerns. NRB 8/10/95

Silviculture Input
Low productivity. Consider deferring from harvest, otherwise plant entire unit with Sitka spruce, Alaska yellow cedar and western red cedar mix. Attempt to blend unit into surrounding muskeg system. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 125

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream

Class 2 Stream

Class 3 Stream

Section Line

Planning Roads

Unit Boundary

Setting Line

Contour or Ortho Line

Beach or Estuary Buffer

Private Land

Implementation Buffer

Anadromous 300 ft. Buffer

Body of Water

Prior Harvest

Updates to Wetlands

LOGGING SYSTEMS Abbrev.

RS Running Skyline

HE Helicopter

HL High Lead

SL Slack Line

SH Shovel Yarding

Projection - Stateplane

Vols 4 - 2

Vols 5 - 0

Vols 6 - 0

Vols 7 - 0

Total Acres - 3

Potential MBF - 86

Quarter Quad - KTNC5SE

VCU Number - 746

Photo Number - 1390-23

Alternative Pattern - 230567

★ Landing

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 127 **Planned Acres:** 8.7 **Estimated Volume:** 202.7 **In Alternatives:** 2 , 3 , 5 , 6 , 7
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC5SE **Photo:** 1390-23 **Logging systems:** - SH
Management Area: K32 **VCU Number:** 746 **Watershed Code:** D79A **WAA Number:** 510 **NOI Unit:** 825 **Original LSTA Unit:** 746-825

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 6.7 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** NE
Volume class breakdown: Class 4: 6.7 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 2.0
Visuals: Seen 0.0 Not Seen 8.7 **VQOs:** PR- 0.0 MM- 8.7 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 8.7 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 8.7 Medium 0.0 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 8.7 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 8.7 3- 0.0 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 3.3
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit consists of forested wetlands (BMP 12.5). Suitable for shovel logging (BMP 13.9). NRB 8/10/95

Timber Input
Planned logging systems design for this unit is Shovel. Confirm final road and landing locations.

Engineering Input
Coho/Pink/Chum timing (June 15 - August 7) may apply to all road construction and/or drainage installations.

Fish/Watershed Input
Class 1 FP3 stream north (TTRA): 200 foot no cut buffer (BMP 12.6, 12.6a).

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 8/10/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

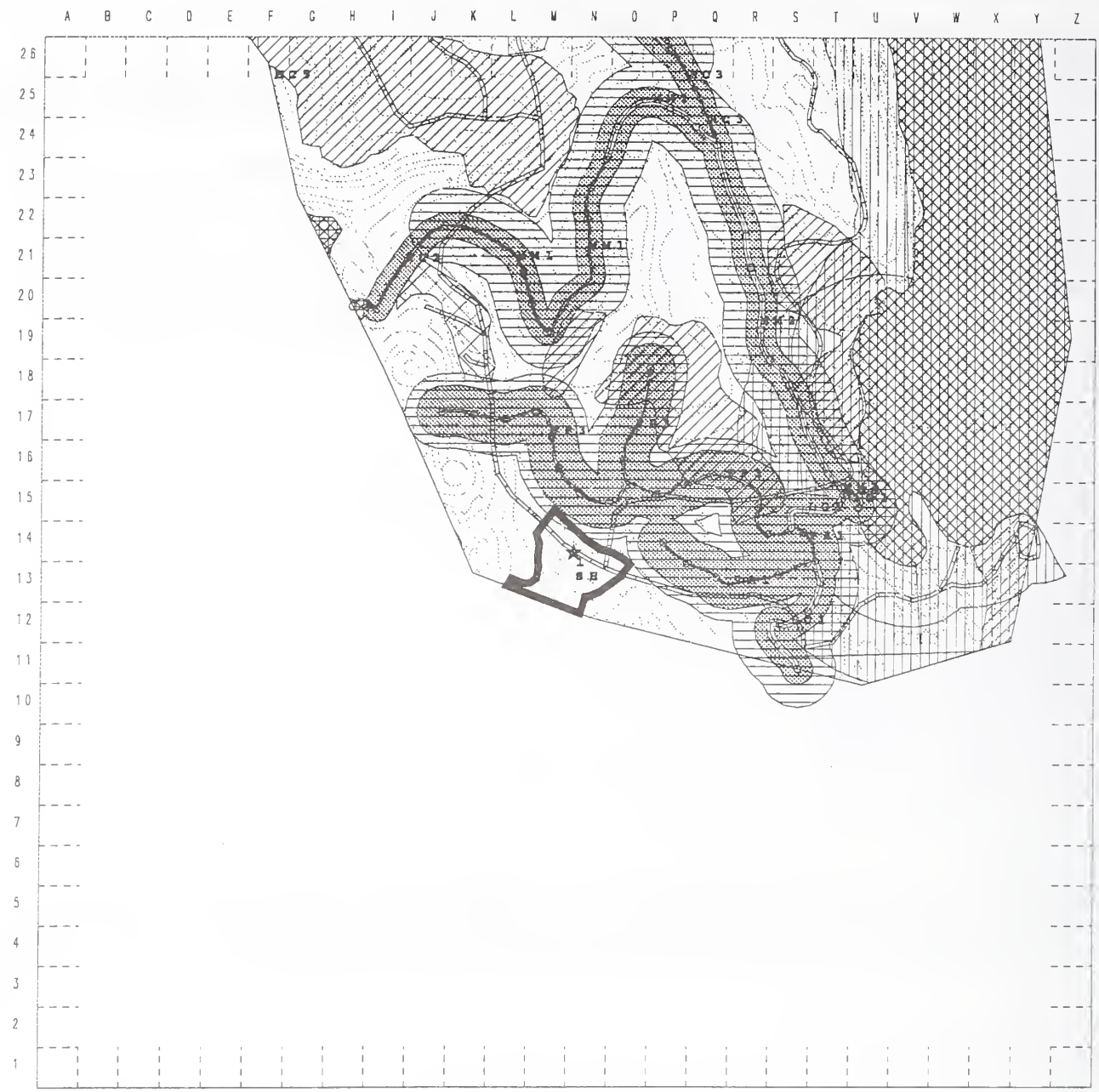
Geological Input
No concerns. NRB 8/10/95

Silviculture Input
Low productivity, containing mostly Hydric soils. Entire unit will require planting a mix of Sitka spruce, Alaska yellow and western red cedar. Attempt to blend unit into surrounding muskeg system. Consider deferring from harvest due to regeneration concerns. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 127

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /tstiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vols 4 - 7
Vols 5 - 0
Vols 6 - 0
Vols 7 - 0
Total Acres - 9
Potential MBF - 203
Quarter Quad - K1NC5SE
VCU Number - 746
Photo Number - 1350-23
Alternative Pattern - 230567

★ Landing

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 130 **Planned Acres:** 24.0 **Estimated Volume:** 824.6 **In Alternatives:** 2 , 3 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 2 **Quad:** KTNC4NW **Photo:** 1890-44 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D69B **WAA Number:** 510 **NOI Unit:** 952 **Original LSTA Unit:** 744-952

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 12.9 Spruce 0.0 Mixed Hem/Spr 10.3 **Nonforested** 0.0 **Aspect:** NW
Volume class breakdown: Class 4: 12.9 Class 5: 0.0 Class 6: 10.3 Class 7: 0.0 **Low Productive** 0.8
Visuals: Seen 0.0 Not Seen 24.0 **VQOs:** PR- 0.0 MM- 24.0 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 24.0 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 24.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 5.0 Soils: 24.0
Mass movement Index: Low 0.0 Medium 15.7 High 8.3 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 2.1 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 3.1 3- 0.0 4- 20.9
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 19.2
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
The upper parts of this unit (N,O-13) have a high landslide potential, MMI=3 (BMP 13.5). Unit contains about 4 acres of forested wetlands in the northeast corner (M-14) (BMP 12.5). Recommend at least partial log suspension when yarding these areas (BMP 13.9). Upper slopes (N-14 to L-12) consist of subalpine ecosystem and includes mountain hemlock plant series. Natural regeneration may be a problem on these soils. Northwest corner (K-14) of unit consists of an alluvial/colluvial fan may contain fish habitat (BMP 12.6). NRB 8/10/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Eastern portion of planned unit appears to be a blindlead. Verify feasibility and modify unit boundary as required.

Engineering Input
High MMI soils. Road construction must minimize landslide potential (BMP 14.7)

Fish/Watershed Input
Class II MC2 stream northwest (TTRA): sideslope plus 100 foot no cut buffer (BMP 12.6, 12.6a).
Class lII AF2 stream northeast: sideslope no cut buffer (BMP 12.6, 12.6a).
Class lII HC6 stream central: split yarding and full suspension required (BMP 13.16, 13.9).

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 8/10/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

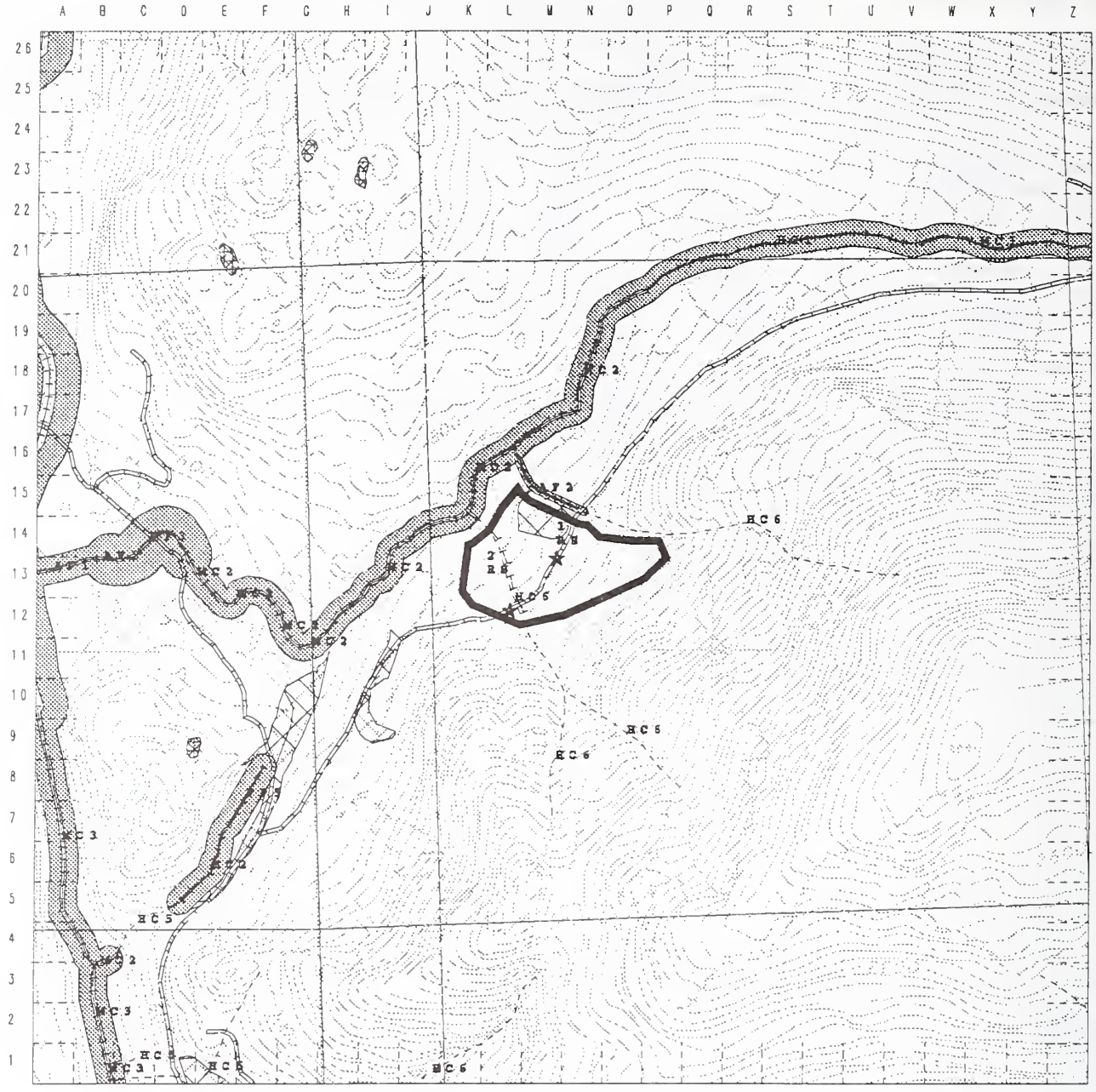
Geological Input
Harvest unit is next to avalanche tract (P-I4 to M-15). Avalanching has potential to damage regeneration and transportation facilities. Recommend that an avalanche firm buffer of trees be maintained along the northeast unit boundary. NRB 8/10/95

Silviculture Input
High productivity with areas of high elevation and Hydric soils that will need to be planted. (6 acres) Plant Sitka spruce adjacent to exisitng avalanche chute. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 130

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fstiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vols 4 - 13
Vols 5 - 0
Vols 6 - 10
Vols 7 - 0
Total Acres - 24
Potential MBF - 825
Quarter Quad - KINC4NW
VCU Number - 744
Photo Number - 1890-44
Alternative Pattern - 230560

★ Landing

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 131 **Planned Acres:** 35.7 **Estimated Volume:** 876.9 **In Alternatives:** 2 , 3 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 3 **Quad:** KTNC4NW **Photo:** 1890-44 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D69B **WAA Number:** 510 **NOI Unit:** 953 **Original LSTA Unit:** 744-953

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 30.1 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** N
Volume class breakdown: Class 4: 30.1 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 5.6
Visuals: Seen 0.0 Not Seen 35.7 **VQOs:** PR- 0.0 MM- 35.7 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 35.7 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 35.7
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 14.0
Mass movement Index: Low 3.1 Medium 32.6 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 3.1 3- 32.6 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 25.7
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit has a medium potential for landslides, MMI=2 (BMP 13.5). No special mitigation measures are required. NRB 8/10/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Southwestern portion of planned unit appears to be a blindlead. Verify feasibility and modify unit boundary as required.

Engineering Input
High MMI soils. Road construction must minimize potential for landslides. (BMP 14.7)

Fish/Watershed Input
Class II MC1 stream north: sideslope plus 100 foot no cut buffer (BMP 12.6, 12.6a).

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 8/10/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

Geological Input
Unit is located next to a large avalanche tract (N-13 to Q-15). Regeneration and transportation facilities may suffer avalanche damage. Recommend that an avalanche firm buffer of trees be maintained along the eastern unit boundary. NRB 8/10/95

Silviculture Input
High productivity with areas of high elevation and high mass movement soils. Planting will be required, using high elevation Sitka spruce and Alaska yellow cedar if available. Pland Sitka spruce adjacent to avalanche chute.(8 acres)

Upper Carroll Study Area Unit Schematic - Final Unit 131

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fstiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Value 4 - 30
Value 5 - 0
Value 6 - 0
Value 7 - 0
Total Acres - 36
Potential MBF - 877
Quarter Quad - ETNC4NW
VCU Number - 744
Photo Number - 1890-44
Alternative Pattern - 230560
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 132 **Planned Acres:** 22.7 **Estimated Volume:** 593.3 **In Alternatives:** 2 , 3 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC4NW **Photo:** 1890-44 **Logging systems:** - RS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D69B **WAA Number:** 510 **NOI Unit:** 954 **Original LSTA Unit:** 744-954

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 21.0 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** SW
Volume class breakdown: Class 4: 21.0 Class 5: 0.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 1.7
Visuals: Seen 0.0 Not Seen 22.7 **VQOs:** PR- 0.0 MM- 22.7 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 22.7 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 22.7
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 0.0 Medium 16.0 High 6.7 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.1 3- 0.0 4- 22.6
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 4.9
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Part of unit above 1,300' elevation (L-14 to N-14) made up of high landslide potential soils, MMI=3 (BMP 13.5). Recommend at least partial log suspension on these soils (BMP 13.9). Lower slopes have a low landslide potential, MMI=1. No special mitigation measures are recommended on these soils. Elevations above 1,500' are subalpine sites with mountain hemlock plant series. Regeneration may be a problem on these sites. NRB 8/10/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Northern portion of planned unit appears to be a blindlead. Verify feasibility and modify unit boundary as required.

Engineering Input
High MMI soils. Road construction must minimize landslide potential (BMP 14.7)

Fish/Watershed
Class II MC1 stream south (TTRA): sideslope plus 100 foot no cut buffer (BMP 12.6, 12.6a).

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
No concerns WEA 8/29/95

Lands Input
No concerns. NRB 8/10/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

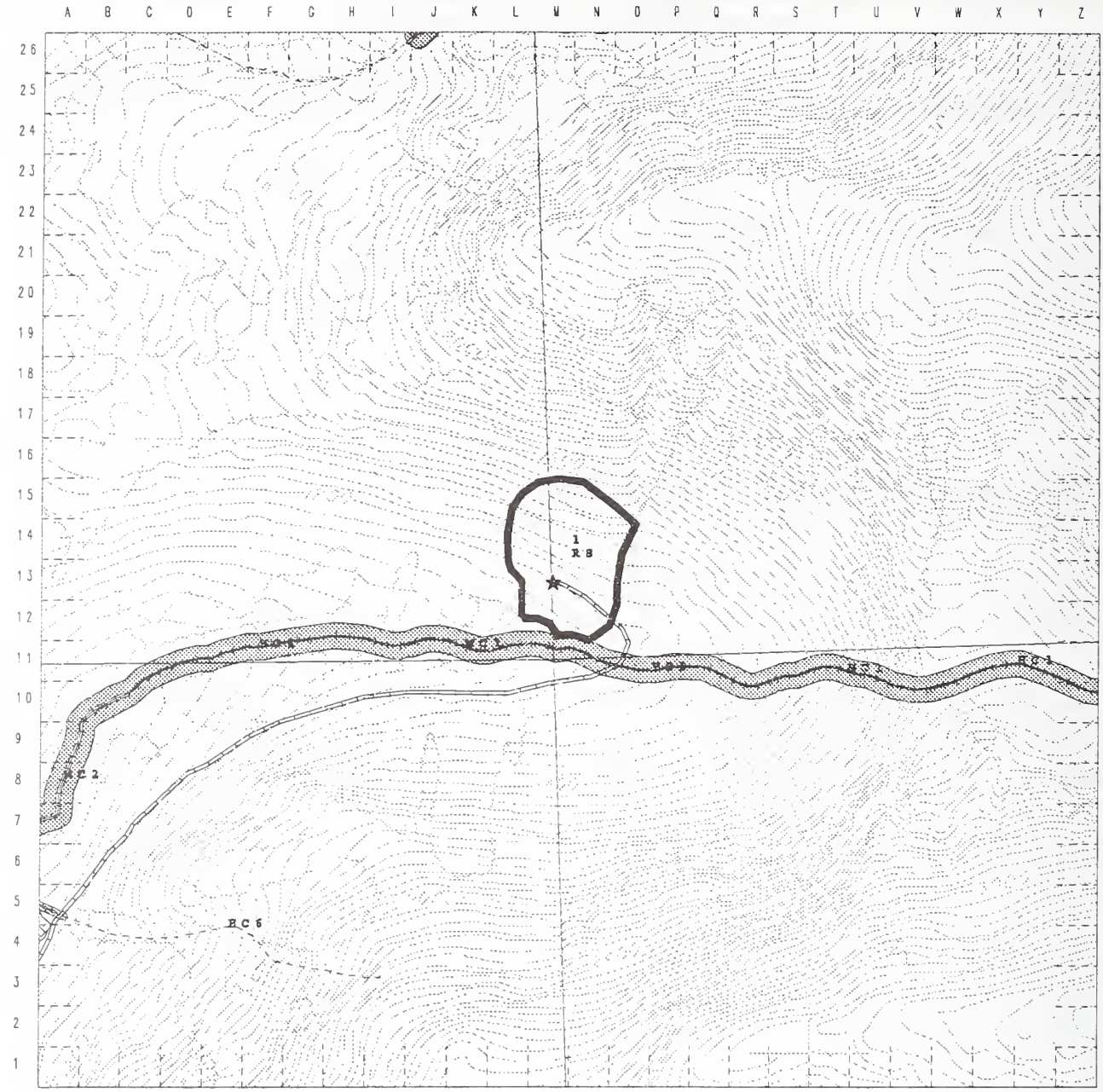
Geological Input
Unit is located next avalanche tract (O-12 to O-15). Regeneration and transportation facilities may be damaged by avalaches. Recommend an avalanche firm buffer be maintained along the eastern unit boundary. NRB 8/10/95

Silviculture Input
High productivity with areas of high elevation, high mass movement soils, as well as existing avalanche chutes. Planting will be required, using Alaska yellow cedar and high elevation Sitka spruce.(8 acres) CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 132

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /tsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vols 4 - 21
Vols 5 - 0
Vols 6 - 0
Vols 7 - 0
Total Acres - 23
Potential WBF - 593
Quarter Quad - KINC4NW
VCU Number - 744
Photo Number - 1890-44
Alternative Pattern - 230560

★ Landing

Feet

0 526 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 133 **Planned Acres:** 12.2 **Estimated Volume:** 552.1 **In Alternatives:** 2 , 0 , 0 , 0 , 0
Silvicultural System : See section **Number of Settings:** 1 **Quad:** KTNC5NE **Photo:** 1890-2 **Logging systems:** - HE
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 955 **Original LSTA Unit:** 744-338

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 12.2 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** SW
Volume class breakdown: Class 4: 0.0 Class 5: 0.0 Class 6: 12.2 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 12.2 Not Seen 0.0 **VQOs:** PR- 0.0 MM- 0.0 M- 12.2 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 11.1 **Low VAC** 1.1 **Roadless** 12.2
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 0.0 Medium 0.4 High 11.8 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.4 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 0.4 4- 11.8
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 1.1
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Recommend at least partial log suspension during yarding on high landslide potential soils MMI=3 (BMP 13.9). NRB 8/10/95

Timber Input
Planned logging systems design for this unit is Helicopter.

Engineering Input
There are no engineering mitigation measures anticipated for this unit.

Fish/Watershed Input
No concerns. NRB 9/23/95

Wildlife Input
Harvest operations restricted to April 1 to October 31 to avoid trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit may be visable from Carroll Inlet. Identified VQO is modification. Shelterwood harvest will help mollify visual impact. WEA 9/30/95

Lands Input
No concerns. NRB 8/10/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

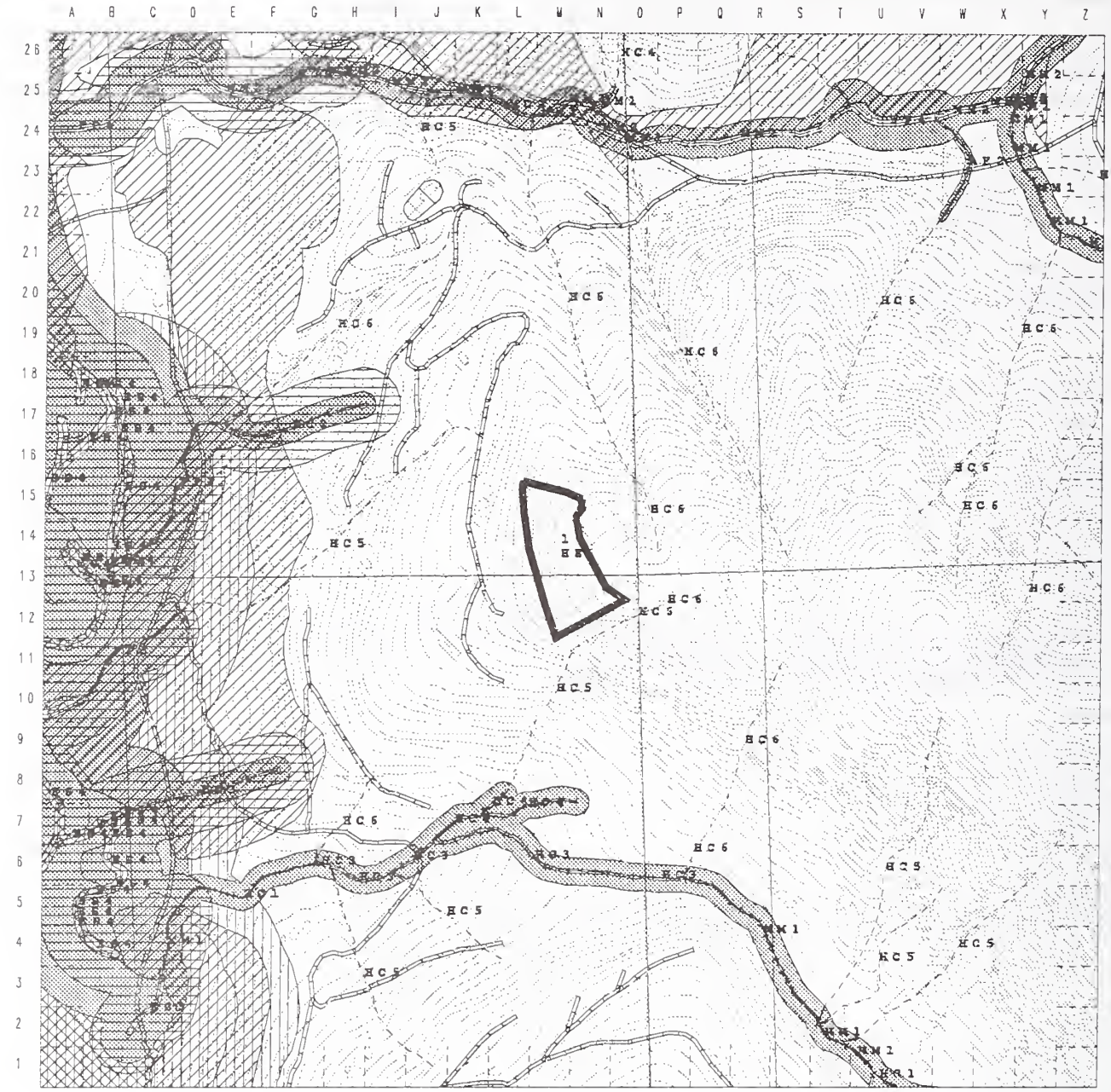
Geological Input
No concerns. NRB 8/10/95

Silviculture Input
High productivity with steep slopes. Apply shelterwood harvest system leaving all trees 13"DBH and smaller standing. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 133

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /tsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Roadmouse 300 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Vols 4 - 0
Vols 5 - 0
Vols 6 - 12
Vols 7 - 0
Total Acres - 12
Potential MBF - 552
Quarter Quad - KTNC5NE
VCU Number - 744
Photo Number - 1850-2
Alternative Pattern - 20000
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet

0 526 1055 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 138 **Planned Acres:** 28.8 **Estimated Volume:** 989.6 **In Alternatives:** 2 , 3 , 5 , 6 , 7
Silvicultural System : See section **Number of Settings:** 3 **Quad:** KTNC5NE **Photo:** 1790-63 **Logging systems:** - RS- HE- LS
Management Area: K32 **VCU Number:** 744 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** 960 **Original LSTA Unit:** 744-381

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 0.0 Spruce 0.0 Mixed Hem/Spr 28.8 **Nonforested** 0.0 **Aspect:** NW
Volume class breakdown: Class 4: 0.0 Class 5: 28.6 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 28.8 Not Seen 0.0 **VQOs:** PR- 0.0 MM- 0.0 M- 28.8 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 28.8 **Low VAC** 0.0 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.1 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 12.1 Medium 0.3 High 16.4 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 0.0 4- 28.8
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 20.9 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 28.8
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Southern half (M-12 to M-14) of harvest unit includes high landslide potential soils (BMP 13.5). Recommend at least partial log suspension when yarding to minimize soil surface disturbance (BMP 13.9). Area also includes rock cliffs that may limit yarding capability and cause blind leads. No concerns in the rest of the unit. NRB 8/24/95

Timber Input
Planned logging systems design for this unit is Running Skyline and Live Skyline. Confirm final road and landing locations.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7) Oversteepened slopes may require full bench construction and endhaul of waste (BMP14.7) Steelhead/Coho/Pink/Chum timing (July 18 - August 7) may apply for all road construction and/or drainage installations.

Fish/Watershed Input
No fisheries or watershed concerns.

Wildlife Input
No wildlife mitigation measures identified.

Recreation / Visuals Input
Unit may be seen from Carroll Inlet. Identified VQO is modification. Uncut timber in front of unit will help to screen views. WEA 9/30/95

Lands Input
No concerns. NRB 8/24/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

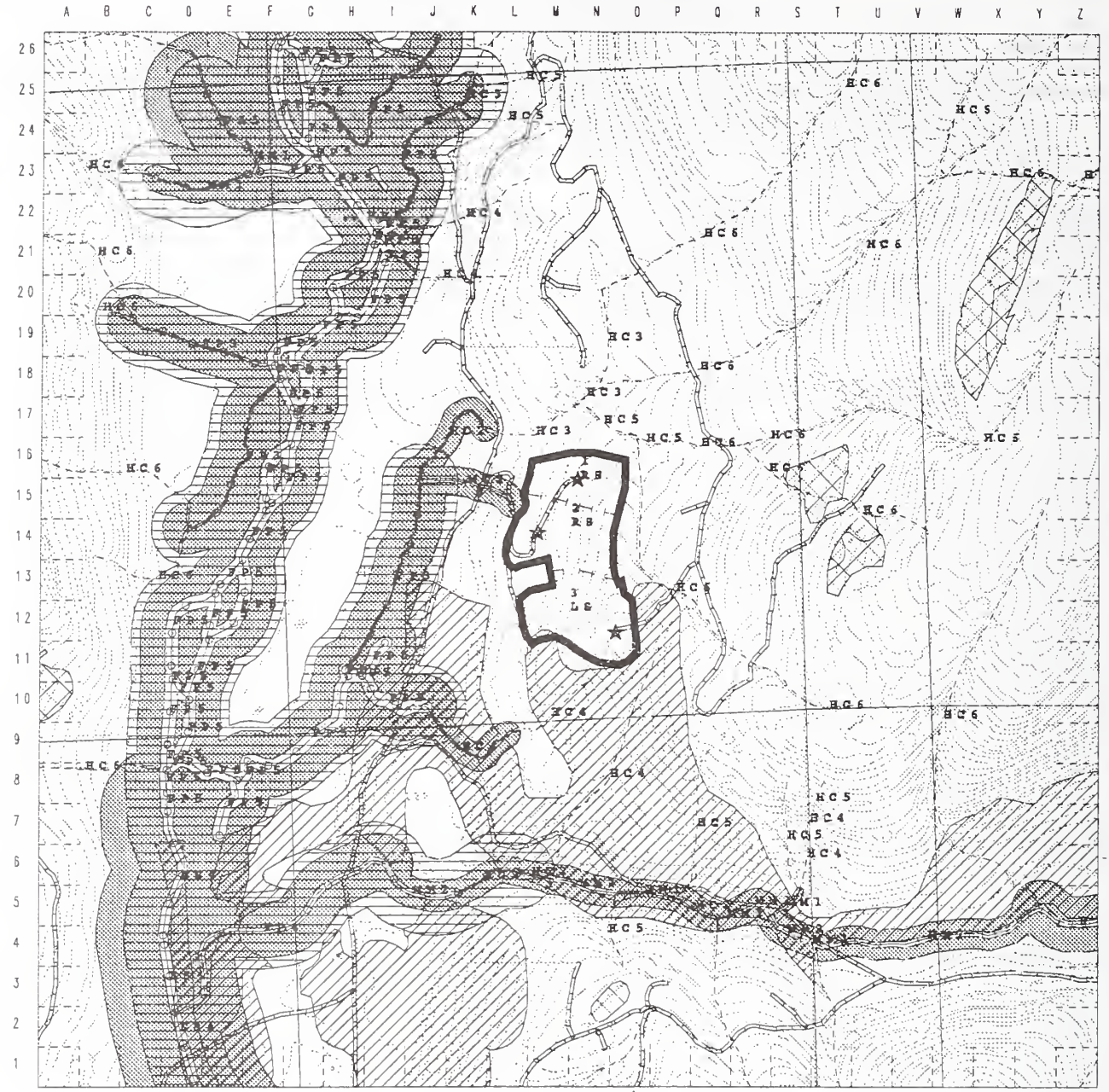
Geological Input
No concerns. NRB 8/24/95

Silviculture Input
Moderate productivity with areas of high mass movement potential soil. Monitor need for planting. CBG 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 138

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /istiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

- Class 1 Stream
- Class 2 Stream
- Class 3 Stream
- Section Line
- Planning Roads
- Unit Boundary
- Setting Line
- Contour or Ortho Line
- Beach or Estuary Buffer
- Private Land
- Implementation Buffer
- Anadromous 300 ft. Buffer
- Body of Water
- Prior Harvest
- Updates to Wetlands

LOGGING SYSTEMS Abbrev.

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Vols 4 - 0
Vols 5 - 29
Vols 6 - 0
Vols 7 - 0
Total Acres - 29
Potential MBF - 990
Quarter Quad - KTNC5NE
VCU Number - 744
Photo Number - 1790-63
Alternative Pattern - 230567

★ Landing

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 139 **Planned Acres:** 17.4 **Estimated Volume:** 582.4 **In Alternatives:** 2 , 0 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 1 **Quad:** **Photo:** **Logging systems:** - RS- HE
Management Area: K32 **VCU Number:** 0 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** **Original LSTA Unit:**

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 17.3 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.1 **Aspect:** SW
Volume class breakdown: Class 4: 2.3 Class 5: 15.0 Class 6: 0.0 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 0.5 Not Seen 16.9 **VQOs:** PR- 0.0 MM- 16.9 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 17.4 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 17.4
Riparian MA: Class 1 Stream: 0.1 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 11.3
Mass movement Index: Low 0.0 Medium 0.0 High 6.1 Very High 11.3 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information Wetland 6.1 Mix Wetland 139.9 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 17.4 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 13.4 River Otter- 0.3 Bald Eagle- 0.0 Black Bear- 15.6
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input Lower portion of unit consists of forested wetlands (BMP 12.5). Upper portion of unit has been reclassified from very high to high landslide potential MMI=3 soils. Recommend at least partial suspension when yarding (BMP 13.9)

Timber Input Planned logging system design for this unit is running skyline and shovel. Confirm final road and landing locations.

Engineering Input High MMI soils. Road construction must minimize landslide potential (BMP 14.7). Steelhead/coho/pink/chum timing (July 18 - August 7) may apply for all road construction and/or drainage installations

Fish/Watershed Input Class I MC2 West (TTRA): 100 ft buffer (BMP 12.6 and 12.64)
Class I HC4 South (TTRA): 120 ft buffer (BMP 12.6 and 12.64) SPL 11/95

Wildlife Input Possible Goshawk nest nearby. If nest is found, current guidelines may affect this unit. No other wildlife mitigation. KB 8/96

Recreation / Visuals Input No concerns. WEA 11/95

Lands Input No concerns. NRB 11/95

Cultural Resource Input No concerns. RL 11/95

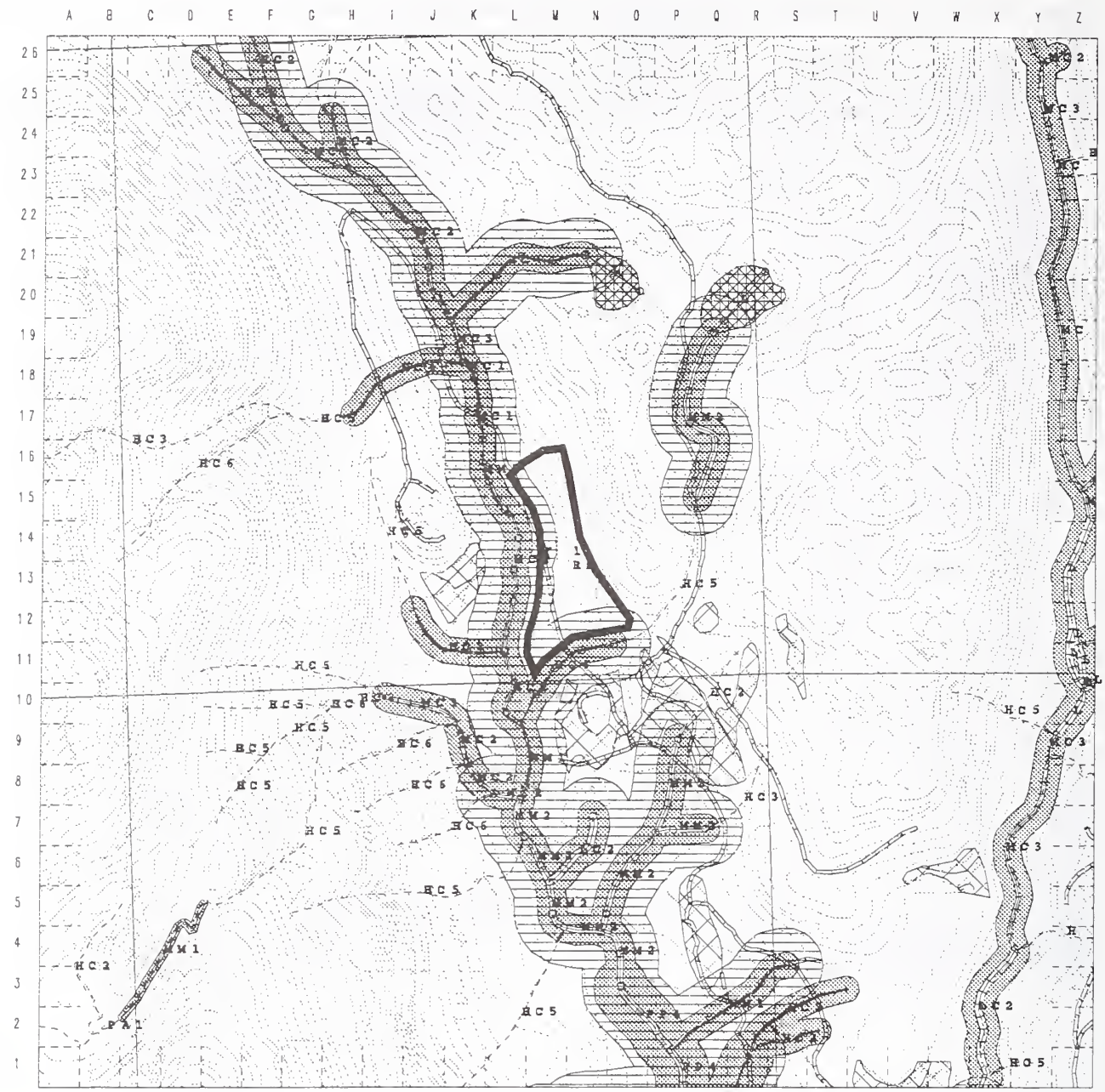
Geological Input No concerns. NRB 11/95

Silviculture Input Moderate productivity with small areas of hydric soils that may require post sale planting. CGB 10/17/95

Upper Carroll Study Area Unit Schematic - Final Unit 139

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fsfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implamentation Buffer
Anadromous 100 ft Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Volc 4 - 2
Volc 5 - 15
Volc 6 - 0
Volc 7 - 0
Total Acres - 17
Potential MBF - 582
Quarter Quad -
VCU Number - 0
Photo Number -
Alternative Pattern - 200560

★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - State> one

Feet
0 525 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 140 **Planned Acres:** 7.9 **Estimated Volume:** 356.1 **In Alternatives:** 0 , 0 , 0 , 0 , 0 ,
Silvicultural System : See section **Number of Settings:** 2 **Quad:** **Photo:** **Logging systems:**
Management Area: K32 **VCU Number:** 0 **Watershed Code:** D70C **WAA Number:** 510 **NOI Unit:** **Original LSTA Unit:**

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 7.9 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** W
Volume class breakdown: Class 4: 0.0 Class 5: 0.0 Class 6: 7.9 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 7.9 Not Seen 0.0 **VQOs:** PR- 0.0 MM- 0.0 M- 7.9 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 7.9 **Low VAC** 0.0 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 0.0 Medium 6.7 High 1.2 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 0.0 4- 7.9
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 7.8
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
Unit contains soils that have a high potential for landslides (BMP 13.5). Recommend at least partial suspension when yarding (BMP 13.9). Roads on these soils may require full-bench construction (BMP 14.7). Over burden should be end-hauled and disposed of near the south end of Harvest Unit 359 (BMP 14.12). NRB 8/29/95

Timber Input
Planned logging systems design for this unit is Running Skyline and Slackline. Confirm final road and landing locations. Eastern portion of planned unit appears to be a blindlead. Upper road/landings maybe needed to yard. Full suspension is required across Class III stream in Western portion of unit. Verify feasibility and modify unit boundary as required.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. Oversteepened slopes may require full bench construction and endhaul of waste. (BMP 14.7)

Fish/Watershed Input
There is a Class III stream flowing through the northwest part of the unit. Recommend that yarding be split on this stream and that full suspension be maintained when yarding across the stream.

Wildlife Input
Harvest operations restricted to April 1 to October 31 to protect trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit may be seen from Carroll estuary. Identified VQO is modification. WEA 9/30/95

Lands Input
No concerns. NRB 8/29/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

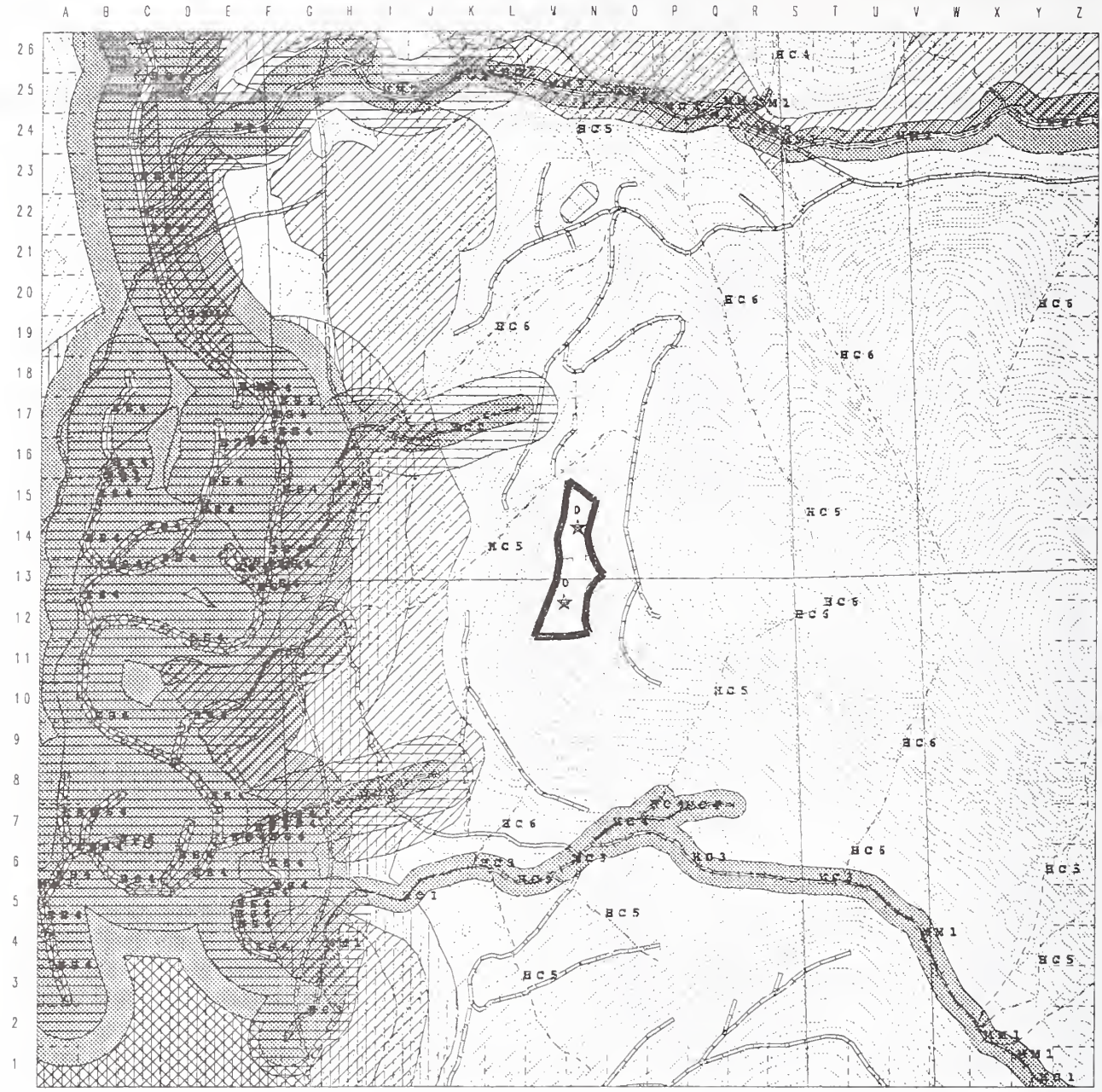
Geological Input
Unit contains several V-notches or incised drainages. Recommend that yarding be split on these V-notches and that any trees within the V-notch be retained (BMP 13.16). NRB 8/29/95

Silviculture Input
Highly productive with small areas of high elevation and high mass movement soils. Plant using Alaska yellow cedar if available. (3 acres) CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 140

Mapscale 1 15840 (4 inch to Mile)

Created 5-24-96, /tsfiles/ref/library/gis/upperCS/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 100 ft Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Volc 4 - 0
Volc 5 - 0
Volc 6 - 8
Volc 7 - 0
Total Acres - 8
Potential WBF - 156
Quarter Quad -
VCU Number - 0
Photo Number -
Alternative Pattern - 00
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - State) ins

Feet

0 528 1056 1582 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 141 **Planned Acres:** 2.3 **Estimated Volume:** 103.0 **In Alternatives:** 2 , 0 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 1 **Quad:** **Photo:** **Logging systems:** - RS- HE
Management Area: K32 **VCU Number:** 0 **Watershed Code:** D71A **WAA Number:** 510 **NOI Unit:** **Original LSTA Unit:**

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 2.3 Spruce 0.0 Mixed Hem/Spr 0.0 **Nonforested** 0.0 **Aspect:** SW
Volume class breakdown: Class 4: 0.0 Class 5: 0.0 Class 6: 2.3 Class 7: 0.0 **Low Productive** 0.0
Visuals: Seen 2.3 Not Seen 0.0 **VQOs:** PR- 2.3 MM- 0.0 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** RM **High VAC** 0.0 **Intermediate VAC** 0.0 **Low VAC** 2.3 **Roadless** 0.0
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.1 Soils: 0.0
Mass movement Index: Low 0.0 Medium 2.3 High 0.0 Very High 0.0 Unknown 0.0 Slopes Greater Than 72% 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 0.0 4- 2.3
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 1.7 River Otter- 1.7 Bald Eagle- 0.0 Black Bear- 1.7
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
No concerns. NRB 8/29/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Northeastern corner of planned unit maybe a blindlead depending on final access road location.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7) Pink/Chum timing (June 1 - August 7) may apply for all road construction and/or drainage installations.

Fish/Watershed Input
A water quality stream flow through the middle of this unit (BMP 12.6a). SPL 1/3/95 Recommend that yarding be split on these streams and that full log suspension be maintained when yarding across the stream (BMP 13.9), trees be felled away from the stream-course and slash be removed within 48 hours (BMP 13.16). Variable width slope-break buffers may also be required for water quality stream located along eastern boundary. (BMP 12.6a) NRB 9/18/95

Wildlife Input
Harvest operations restricted to April 1 to October 31 to protect trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit may be visable from Carroll estuary. Identified VQO is partial retention. Beach and estuary buffer will help screen unit. WEA 9/30/95

Lands Input
No concerns. NRB 8/29/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

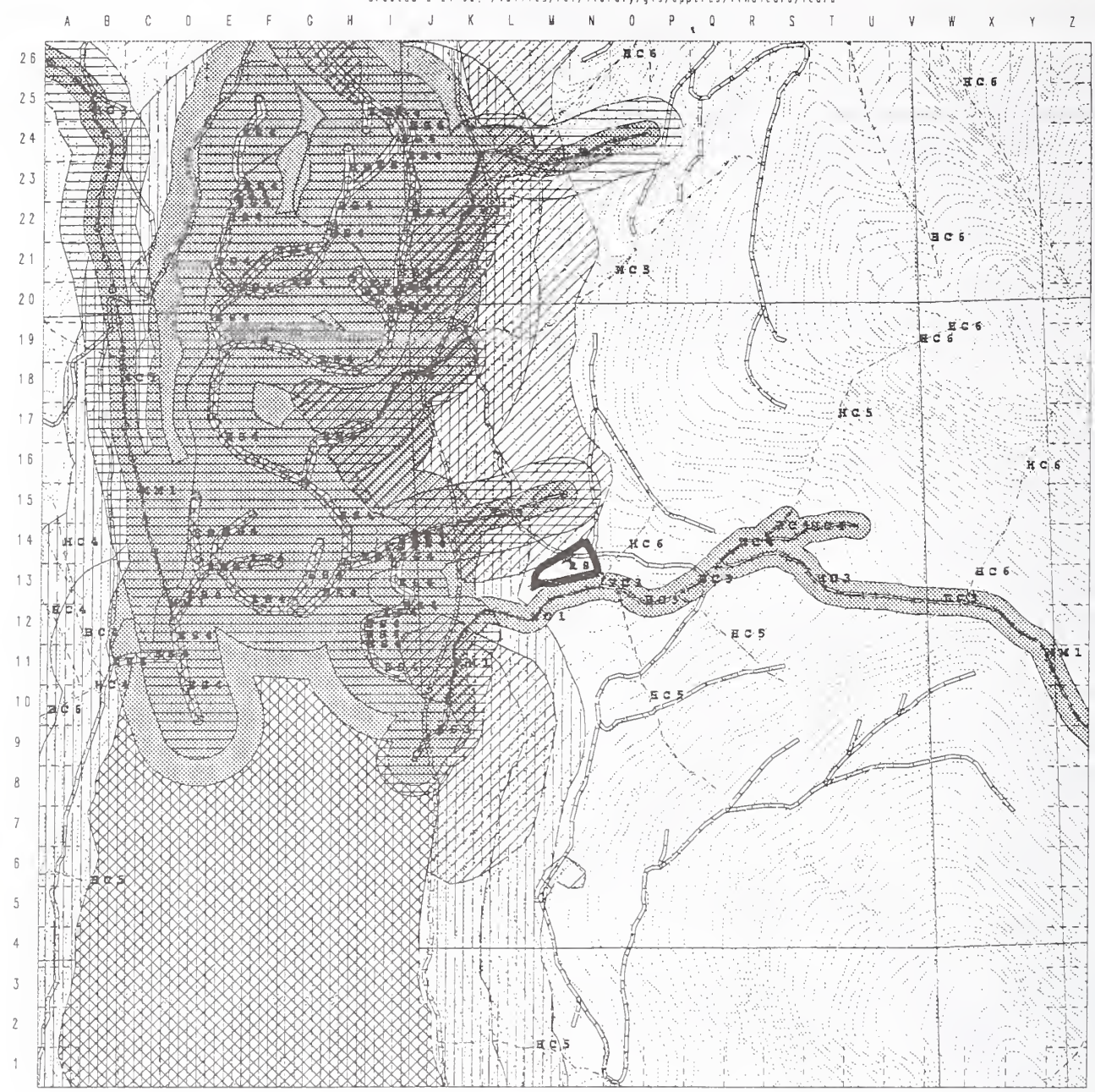
Geological Input
No concerns. NRB 8/29/95

Silviculture Input
Highly productive with small areas of high elevation and high mass movement soils. Planting will be required, using Alaska yellow cedar if available. (3 acres) Consideration should be given to a diameter limit cut leaving all trees 13" DBH and under standing if helicopter yarded. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 141

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /1sfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards

Class 1 Stream

Class 2 Stream

Class 3 Stream

Section Line

Planning Roads

Unit Boundary

Setting Line

Contour or Ortho Line

Beach or Estuary Buffer

Private Land

Implementation Buffer

Anadromous 100 ft Buffer

Body of Water

Prior Harvest

Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline

HE Helicopter

HL High Lead

SL Slack Line

SH Shovel Yarding

Vols 4 - 0

Vols 5 - 0

Vols 6 - 2

Vols 7 - 0

Total Acres - 2

Potential MBF - 103

Quarter Quad -

VCU Number - 0

Photo Number -

Alternative Pattern - 230560

★ Landing

Feet

0 529 1056 1582 2112

Projection - State one

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 142 **Planned Acres:** 19.3 **Estimated Volume:** 842.8 **In Alternatives:** 0 , 0 , 5 , 0 , 0
Silvicultural System : See section **Number of Settings:** 4 **Quad:** **Photo:** **Logging systems:**

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 0.2 Spruce 0.0 Mixed Hem/Spr 18.4 **Nonforested** 0.0 **Aspect:** NW
Volume class breakdown: Class 4: 0.0 Class 5: 0.2 Class 6: 18.4 Class 7: 0.0 **Low Productive** 0.7
Visuals: Seen 19.3 Not Seen 0.0 **VQOs:** PR- 0.0 MM- 0.0 M- 19.3 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** SPNM **High VAC** 0.0 **Intermediate** VAC 19.3 **Low** VAC 0.0 **Roadless** 19.1
Riparian MA: Class 1 Stream: 0.0 Class 2 Stream: 0.0 Class 3 Stream: 0.6 Soils: 0.0
Mass movement Index: Low 0.0 Medium 9.8 High 9.5 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 0.0 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.0 2- 0.0 3- 0.0 4- 19.3
High Value Habitat: Sitka Black-Tail Deer- 0.0 Marten- 0.0 River Otter- 0.0 Bald Eagle- 0.0 Black Bear- 19.3
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
No concerns. NRB 8/29/95

Timber Input
Planned logging systems design for this unit is Running Skyline. Confirm final road and landing locations. Northeastern corner of planned unit maybe a blindlead depending on final access road location.

Engineering Input
High MMI soils. Road construction must minimize landslide potential. (BMP 14.7) Pink/Chum timing (June 1 - August 7) may apply for all road construction and/or drainage installations.

Fish/Watershed Input
A water quality stream flow through the middle of this unit (BMP 12.6a). SPL 1/3/95 Recommend that yarding be split on these streams and that full log suspension be maintained when yarding across the stream (BMP 13.9), trees be felled away from the stream-course and slash be removed within 48 hours (BMP 13.18). Variable width slope-break buffers may also be required for water quality stream located along eastern boundary. (BMP 12.6a) NRB 9/18/95

Wildlife Input
Harvest operations restricted to April 1 to October 31 to protect trumpeter swan resting/feeding areas.

Recreation / Visuals Input
Unit may be visable from Carroll estuary. Identified VQO is partial retention. Beach and estuary buffer will help screen unit. WEA 9/30/95

Lands Input
No concerns. NRB 8/29/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

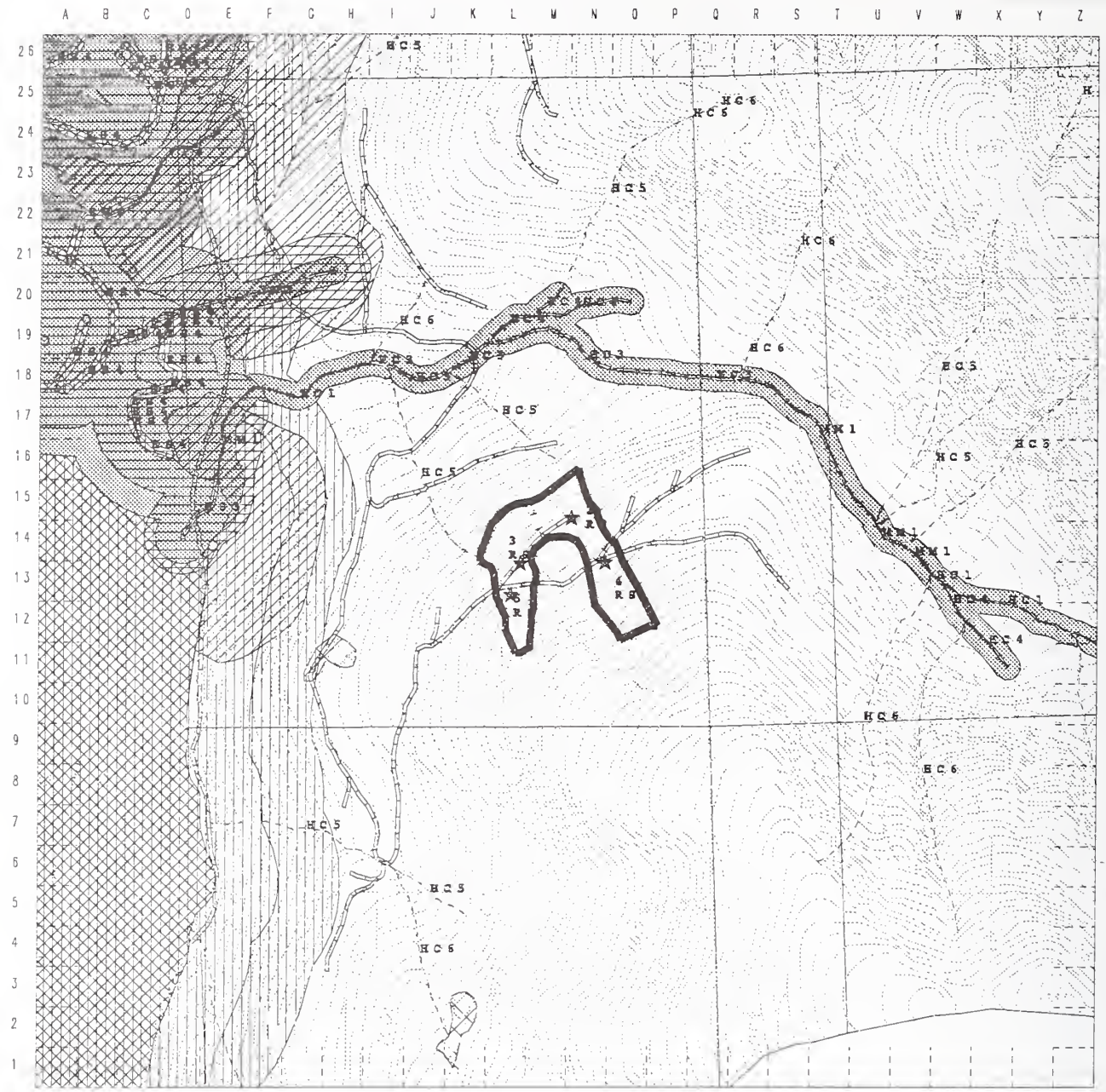
Geological Input
No concerns. NRB 8/29/95

Silviculture Input
Highly productive with small areas of high elevation and high mass movement soils. Planting will be required, using Alaska yellow cedar if available. (3 acres) Consideration should be given to a diameter limit cut leaving all trees 13" DBH and under standing if helicopter yarded. CBG 10/16/95

Upper Carroll Study Area Unit Schematic - Final Unit 142

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /fstiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data This map may not meet National Map Accuracy Standards

Class 1 Stream
Class 2 Stream
Class 3 Stream
Section Line
Planning Roads
Unit Boundary
Setting Line
Contour or Ortho Line

Beach or Estuary Buffer
Private Land
Implementation Buffer
Anadromous 100 ft. Buffer
Body of Water
Prior Harvest
Updates to Wetlands

Volc 4 - 0
Volc 5 - 0
Volc 6 - 18
Volc 7 - 0
Total Acres - 19
Potential MBF - 845
Quarter Quad -
VCU Number - 0
Photo Number -
Alternative Pattern - 50
★ Landing

LOGGING SYSTEMS Abbrev

RS Running Skyline
HE Helicopter
HL High Lead
SL Slack Line
SH Shovel Yarding

Projection - Stateplane

Feet

0 528 1056 1584 2112

Upper Carroll FEIS - Unit Data Card - Planned Configuration

FEIS Unit: 143 **Planned Acres:** 21.9 **Estimated Volume:** 716.9 **In Alternatives:** 0 , 0 , 5 , 6 , 0
Silvicultural System : See section **Number of Settings:** 3 **Quad:** **Photo:** **Logging systems:** - RS- HE
Management Area: K32 **VCU Number:** 0 **Watershed Code:** D70C **WAA Number:** 510 NOI Unit: **Original LSTA Unit:**

Physical Description

(Numbers are Acres unless otherwise noted)
Forest type: Cedar 0.0 Hemlock 15.7 Spruce 0.0 Mixed Hem/Spr 3.3 **Nonforested** 0.0 **Aspect:** S
Volume class breakdown: Class 4: 0.0 Class 5: 15.7 Class 6: 3.3 Class 7: 0.0 **Low Productive** 2.9
Visuals: Seen 0.0 Not Seen 21.9 **VQOs:** PR- 0.0 MM- 21.9 M- 0.0 P- 0.0 R- 0.0
Recreation: **Primary ROS Code** P **High VAC** 21.9 **Intermediate VAC** 0.0 **Low VAC** 0.0 **Roadless** 21.9
Riparian MA: Class 1 Stream: 2.1 Class 2 Stream: 0.0 Class 3 Stream: 0.0 Soils: 0.0
Mass movement Index: Low 8.1 Medium 13.8 High 0.0 Very High 0.0 Unknown 0.0 **Slopes Greater Than 72%** 0.0
Wetland Information: Wetland 8.1 Mix Wetland 0.0 Riparian Soil 0.0 **Site Productivity Classes** 1- 0.3 2- 7.9 3- 13.8 4- 0.0
High Value Habitat: Sitka Black-Tail Deer- 5.0 Marten- 21.9 River Otter- 5.6 Bald Eagle- 1.3 Black Bear- 17.5
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input
The north central part of the unit (M,N-15) contains an area of high landslide potential, MMI=3 (BMP 13.5). The north (K-16, L-15) parts and the south end of the unit (N-9) includes some forested wetlands (BMP 12.5). Recommend at least partial log suspension when yarding these areas (BMP 13.9). NRB 8/30/95

Timber Input
Planned logging systems design for this unit is Running Skyline and Live Skyline. Confirm final road and landing locations.

Engineering Input
High MMI soils in some areas. Road construction must minimize landslide potential. (BMP 14.7) Steelhead/Coho/Pink/Chum timing (July 18 - August 7) may apply for all road construction and/or drainage installations.

Fish/Watershed Input
This unit contains two Class III streams in the northwest portion of the unit. Recommend that yarding be split on these streams, and that trees be felled away from stream. This unit is also adjacent to one class III stream along the northern boundary. Variable slope break buffer may be required in this area. Due to temperature sensitivity concerns, all trees less than 12 inches DBH within 35 feet of class III streams will remain standing, or a windfirm buffer will be deliniated.

Wildlife Input
Maintain distribution of snags by leaving 1-5 acre-sized islands of green trees at a rate of 1 acre of island for every 20 acres harvested. Leave islands must be compatible with logging systems and safe working conditions.

Recreation / Visuals Input
No concerns. WEA 9/30/95

Lands Input
No concerns. NRB 8/30/95

Cultural Resource Input
No cultural resources identified. RL 9/30/95

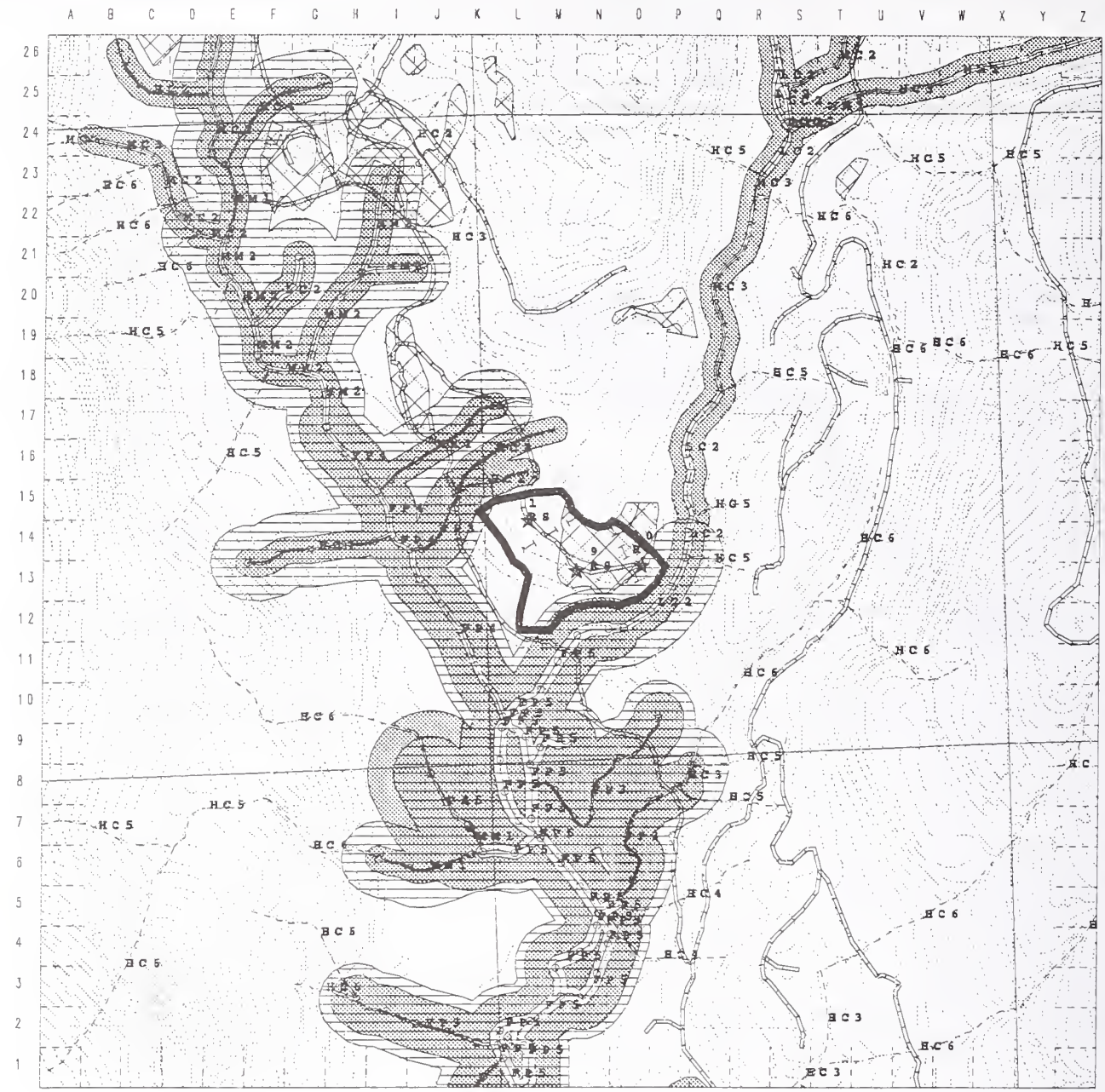
Geological Input
No concerns. NRB 8/30/95

Silviculture Input
Moderate productivity, with small areas of Hydric soils that will need to be planted. (15 acres) CBG 10/16/95 Prescription should address partial cut stream buffer.

Upper Carroll Study Area Unit Schematic - Final Unit 143

Mapscale 1:15840 (4 inch to Mile)

Created 5-24-96, /1stfiles/ref/library/gis/upperc5/finalcard/fcard



Note: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards.

Class 1 Stream

Class 2 Stream

Class 3 Stream

Section Line

Planning Roads

Unit Boundary

Setting Line

Contour or Ortho Line

Beach or Estuary Buffer

Private Land

Implementation Buffer

Anadromous 300 ft. Buffer

Body of Water

Prior Harvest

Updates to Wetlands

LOGGING SYSTEMS Abbrev

RS Running Skyline

HE Helicopter

HL High Lead

SL Slack Line

SH Shovel Yarding

Projection - State Zone

Volc 4 - 0

Volc 5 - 16

Volc 6 - 3

Volc 7 - 0

Total Acres - 22

Potential MBF - 717

Quarter Quad -

VCU Number - 0

Photo Number -

Alternative Pattern - 560

★ Landing

Feet

0 528 1056 1582 2112

Appendix K

Part 2 - Road Cards

APPENDIX K

Road Design Cards

Access Management

The project area is isolated from other major road systems. Accordingly, only intermittent resource management and off-road vehicular and foot traffic is expected.

During resource management activity, the roads will be maintained commensurate with that activity. After completion of the management activity, the roads will revert to the following maintenance levels.

Maintenance level 1 roads are closed by bridge removal or organic encroachment and are monitored for resource protection.

Maintenance level 2 roads are maintained for high clearance vehicles and monitored for resource protection.

Accordingly, the road management strategy is as follows.

All roads will be closed to public vehicle use.

Main trunk roads will receive long-term access for forest administration such as future timber or salvage sales, fish pass access, and maintenance and traffic associated with special use permits. Such roads will remain open for high clearance vehicular traffic.

Several roads are expected to be used for long term cyclic forest administrative activities with minimal use expected for moderately long periods of time. Accordingly, such roads will be left open for high clearance vehicles. However, the entire road template will be seeded. This will include the road surface and the cut and fill slopes.

Some roads are not anticipated to be needed for any future activites or use. These roads will be closed by eliminating access, including removing all drainage structures, scarifying the roadbed and seeding.

Seeding of the road bed is a technique to retard alder growth, achieve low maintenance costs, and reduce road reactivation costs when re-used for transporting forest products.

Numerous roads are expected to be used intermittently with long periods of non-use. Most modular bridges will be removed upon completion of harvest activities. Other drainage structures will be left in place.

Road Design Cards

The road cards display roads contained in alternatives 1 through 5 collectively. Accordingly, each alternative may or may not include all of, or portions of, each road displayed.

Some existing roads displayed on the road cards to not reflect stream crossings as drainage structure replacement was not anticipated. Should it be found necessary to replace structures on such roads, the structures will be reconstructed in accordance with pertinent BMPs and design standards as used for new facilities.

Due to map scale, road cards do not reflect many roads 1/4 mile and under. See Unit Cards for details concerning such roads.

The Road Card Appendix consists of three seperate documents. They are:

1) Road Management Objectives
2) Definition of Traffic Service levels
3) Road Card Maps

TRAFFIC SERVICE LEVELS

Traffic Service Levels. Traffic service levels (TSL) describe a road's significant traffic characteristics and operating conditions. The levels reflect a number of factors, such as speed, travel time, traffic interruptions, freedom to maneuver, safety, driver comfort, convenience, and operating cost. These factors, in turn, affect design elements, such as:

a. Number of lanes.

b. Turnout spacing.

c. Lane widths.

d. Type of driving surface.

e. Sight distances.

f. Design speed.

g. Clearance.

h. Horizontal and vertical alignment.

i. Curve widening.

j. Turnarounds.

The following table contains descriptions of the four different levels of traffic service for Forest roads.

	A	B	C	D
Flow	free flowing with adequate passing facilities.	Congested during heavy traffic such as peak logging or recreation activities.	Interrupted by limited passing facilities, or slowed by the road condition	Flow is slow or may be blocked by an activity. Two way traffic is difficult and may require backing to pass.
Volume	uncontrolled will accommodate the expected traffic volumes.	Occasionally controlled during heavy use periods.	Erratic; frequently controlled as the capacity is reached.	Intermittent and usually controlled. Volume is limited to that associated with the single purpose.
Vehicle Types	Mixed; includes the critical vehicle and all vehicles normally found on public roads	Mixed; includes the critical vehicle and all vehicles normally found on public roads	Controlled mix; accommodates all vehicle types including the critical vehicle. Some use may be controlled to minimize conflicts between vehicle types.	Single use; not designed for mixed traffic. Some vehicles may not be able to negotiate Concurrent use between commercial and other traffic is restricted.
Critical Vehicle	Clearances are adequate to allow free travel. Overload permits are required.	Traffic controls needed where clearances are marginal. Overload permits required.	Special provisions may be needed. Some vehicles will have difficulty negotiating some segments.	Some vehicles may not be able to negotiate. Loads may have to be off-loaded and walked into.
Safety	Safety features are part of the design.	High priority in design Some protection is accomplished by traffic management.	Most protection is provided by traffic management.	The need for protection is minimized by low speed and strict traffic controll.
Traffic Management	Normally limited to regulatory, warning, and guide signs and permits.	Employed to reduce traffic volume and conflicts.	Traffic controls are frequently needed during periods of high use by the dominant resource activity.	Used to discourage or prohibit traffic other than that associated with the single purpose.
User Costs	Minimize; transportation efficiency is important.	Generally higher than "A" because of slower speeds and increased delays	Not important; efficiency of travel may be traded for lower construction costs.	Not considered.
Alignment	Design speed is predominant factor within feasible topographic limitations.	Influenced more strongly by topography than by speed and efficiency.	Generally dictated by topographic features and environmental fctors. Design speeds are generally low.	Dictated by topography, environmental factors, and the design and critical vehicle limitations. Speed is not important.
Road Surface	Stable and smooth with little or no dust, considering the normal season of use.	Stable for the predominant traffic for the normal use season. Periodic dust control for heavy use or environmental reasons. Smoothness is commensurate with the design speed.	May not be stable under all traffic or weather conditions during normal use season. Surface rutting, roughness, and dust may be present but controlled for environmental or investment protection.	Rough and irregular. Travel with low clearance vehicles is difficult. Stable during dry conditions. Rutting and dusting controlled only for soil and water protection.

UPPER CARROLL ACCESS MANAGEMENT
ROAD MANAGEMENT OBJECTIVES

Road Number	Traffic Service Level	Road Management Objectives	Existing or New Construction	Post Sale Maintenance Level	Method of Closure	Stream Crossings I	Stream Crossings II	Stream Crossings III	Fisheries Restrictions T	Fisheries Restrictions P	Swan Timing	Footnote reference #, Remarks and/or Concerns
8000000	D	Close	E/C	2	Admin	x	x	x	x	x	x	admin. access, #1, #2
8000799	D	Close	E/C	E	Barrier			x			x	F&W, economics, #4, #2
8000802	D	Close	E	1	Barrier							Economics, #3
8300000	D	Close	C/E	2	Admin.	x	x	x	x	x	x	Admin access,#1, #2
8300790	D	Close	C	E	Barrier			x	x			F&W,economics, #4
8300800	D	Close	C	1	Barrier		x	x		x	x	Economic, #3, #2
8300820	D	Close	C	1	Barrier		x	x	x		x	Trib. to 8300800, #3, #2
8300825	D	Close	C	1	Barrier			x			x	Trib. to 8300800, #3, #2
8337000	D	Close	E	1	Barrier		x	x				Economics, #3
8337100	D	Close	E	1	Barrier			x				Economics, #3
8340000	D	Close	E	2	Admin							Admin. access, #1
8340100	D	Close	E	2	Admin							Admin. access, #1
8400000	D	Close	E/C	2	Admin	x	x	x	x	x	x	Admin. access, #1, #2
8400500	D	Close	C	1	Barrier		x	x	x	x	x	Economics, #3, #2
8400550	D	Close	C	1	Barrier	x		x	x	x	x	Economics, #3, #2
8400600	D	Close	C	1	Barrier			x				Economics, #3
8400610	D	Close	C	1	Barrier			x				Economics, #3
8400615	D	Close	C	1	Barrier			x				Economics, #3
8400620	D	Close	C	1	Barrier			x				Trib. to 8400630, #3
8400630	D	Close	C	1	Barrier			x				Economics, #3
8400680	D	Close	C	E	Barrier							Economics, #4
8400690	D	Close	C	E	Barrier			x				Economics, #4
8400640	D	Close	C	1	Barrier			x				Trib.to 8400630, #3
8400700	D	Close	C	E	Barrier		x	x		x		Economics, #4
8400800	D	Close	C	1	Barrier		x	x		x		Economics, #3
8400801	D	Close	C	1	Barrier			x				Economics, #3
8400810	D	Close	C	1	Barrier			x				Trib. to 8400800, #3
8400820	D	Close	C	1	Barrier							Trib. to 8400800, #3

Note:1. Post Harvest maintenance level 2 roads, will be open for administrative use only(monitoring & post sale silvicultural activities).

2. Swan timing will apply to these roads within 1/2 mile of the shoreline in the Carroll Creek estuary and the Neets Bay estuary.

3. Upon completion of post sale activities, roads that have modular bridges scheduled to be removed and other maintenance level 1 roads, shall receive maintenance level 1 work as required by FSH 7709.58 and in full conformance with BMP 14.20.

4. Maintenance level E indicates eliminating access. This requires removal of all drainage structures, scarifying the road prism and seeding the entire roadway. Roads that have E level maintenance will have drainage structures installed at designated streams only, no crossdrains.

UPPER CARROLL ACCESS MANAGEMENT
ROAD MANAGEMENT OBJECTIVES

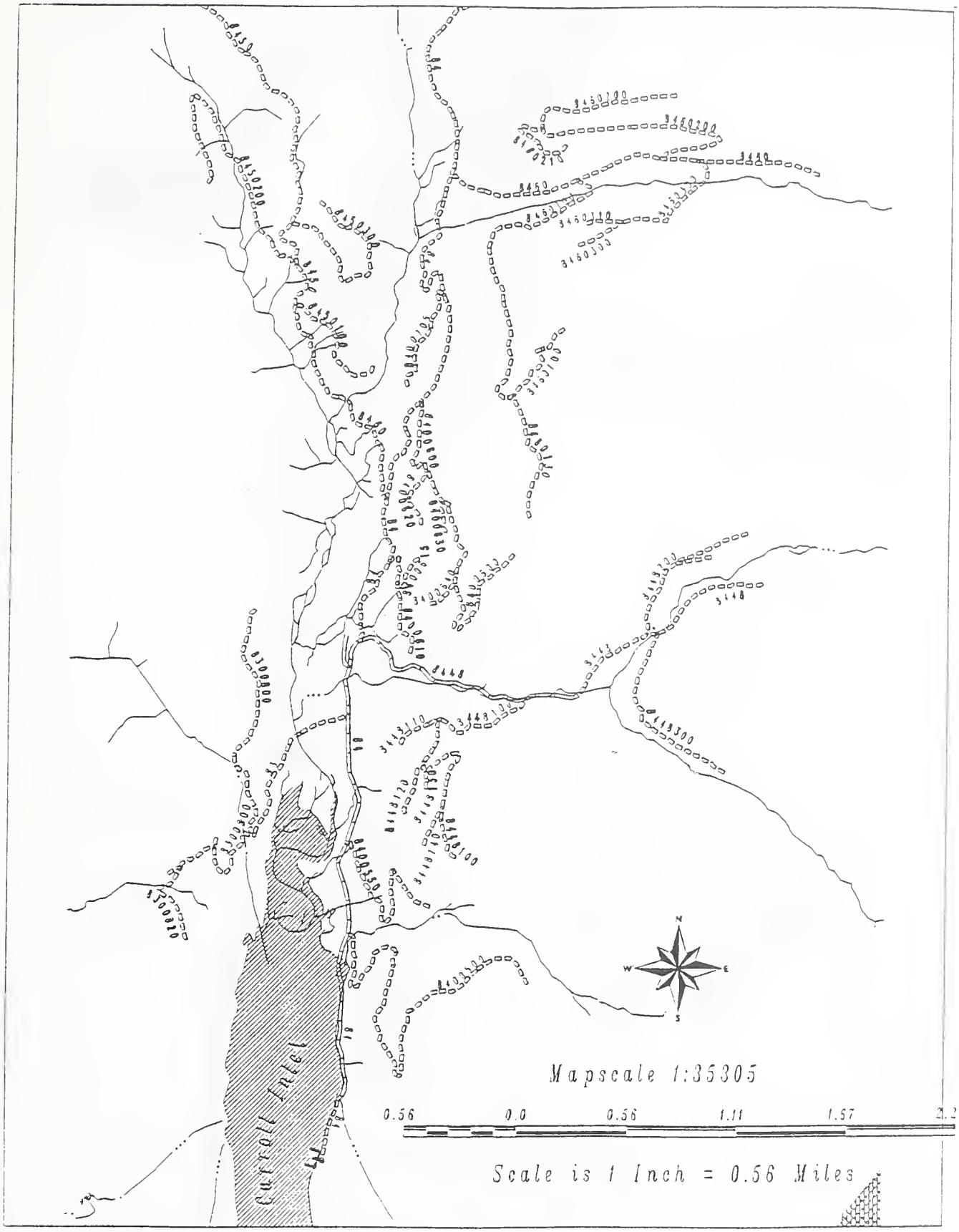
Road Number	Traffic Service Level	Road Management Objectives	Existing or New Construction	Post Sale Maintenance Level	Method of Closure	Stream Crossings I	Stream Crossings II	Stream Crossings III	Fisheries ResTrictions T	Fisheries ResTrictions P	Swan Timing	Footnote reference #, Remarks and/or Concerns
8400850	D	Close	C	1	Barrier			x				Economics, #3
8400900	D	Close	E/C	1	Barrier	x	x	x	x	x		Economics, #3
8400920	D	Close	C	1	Barrier			x				Trib. to 8400900, #3
8448000	D	Close	E/C	2/E	Barrier		x	x	x	x		Admin. access, #1, #4
8448100	D	Close	C	1	Barrier		x	x	x	x		Economics, #3
8448110	D	Close	C	1	Barrier			x				Trib. to 8448100, #3
8448120	D	Close	C	1	Barrier			x				Trib. to 8448100, #3
8448130	D	Close	C	1	Barrier			x				Trib. to 8448100, #3
8448140	D	Close	C	1	Barrier			x				Trib. to 8448100, #3
8448200	D	Close	C	E	Barrier		x	x	x	x		Trib. to 8448000, #4
8448300	D	Close	C	E	Barrier			x				Trib. to 8448000, #4
8450000	D	Close	C	1	Barrier	x	x	x	x	x		Economics,W/L, #3
8450100	D	Close	C	1	Barrier		x	x		x		Trib. to 8450000, #3
8450200	D	Close	C	1	Barrier	x	x	x	x	x		Trib. to 8450000, #3
8450300	D	Close	C	1	Barrier			x	x			Trib. to 8450000, #3
8460000	D	Close	C	1/E	Barrier		x	x	x	x		Economics, #3, #4
8460100	D	Close	C	1	Barrier		x	x	x	x		Trib. to 8460000, #3
8460110	D	Close	C	1	Barrier			x				Trib. to 8460000, #3
8460200	D	Close	C	1/E	Barrier			x				Trib. to 8460000,#3, #4
8460210	D	Close	C	E	Barrier			x				Economics, #4
8460300	D	Close	C	1	Barrier		x	x	x	x		Trib. to 8460000, #3
8460310	D	Close	C	1	Barrier			x				Trib. to 8460000, #3
8470000	D	Close	C	1	Barrier		x	x		x		Economics, #3
8470200	D	Close	C	1	Barrier			x				Trib. to 8470000, #3

Note:1. Post Harvest maintenance level 2 roads, will be open for administrative use only(monitoring & post sale silvicultural activities).

2. Swan timing will apply to these roads within 1/2 mile of the shoreline in the Carroll Creek estuary and the Neets Bay estuary.

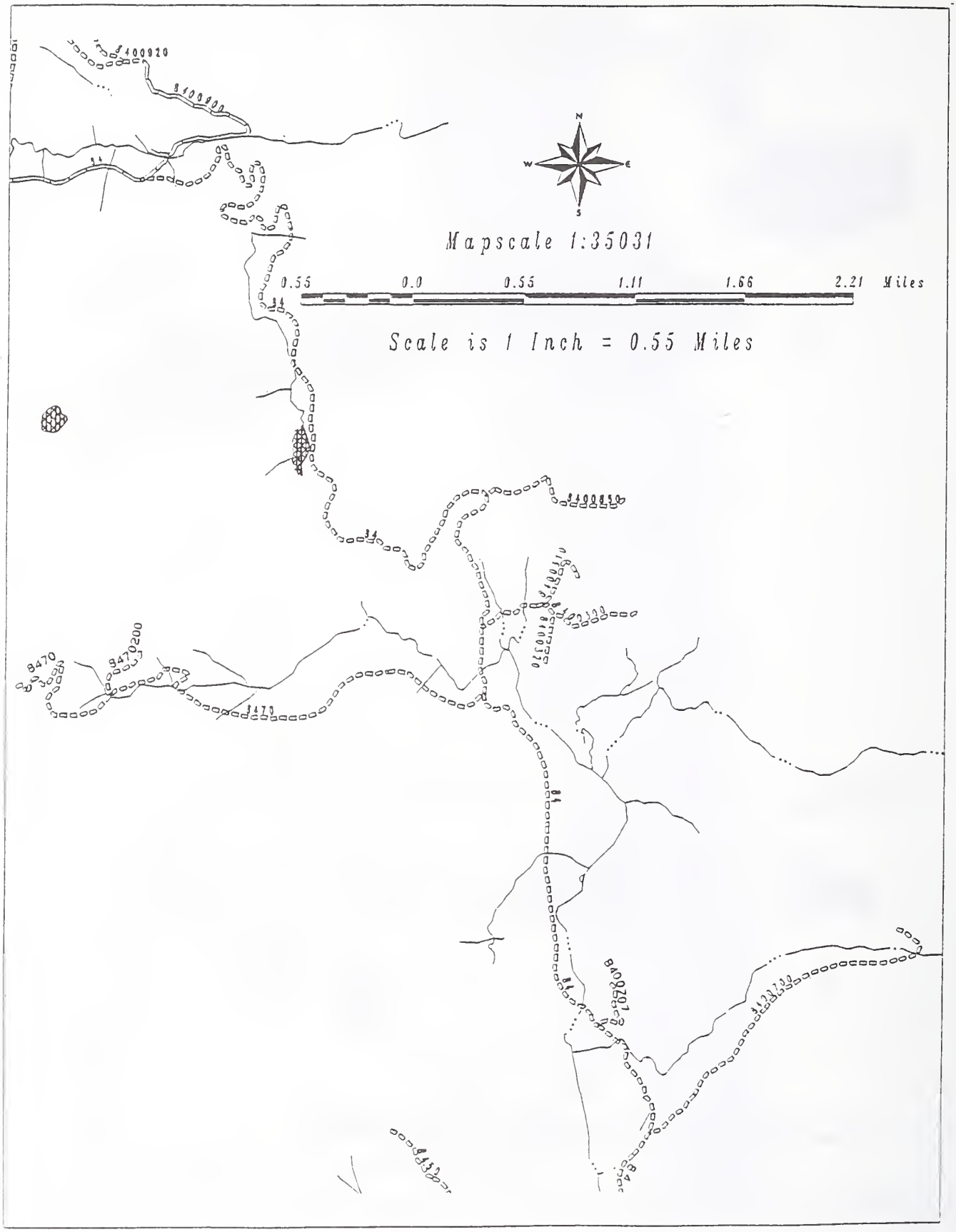
3. Upon completion of post sale activities, roads that have modular bridges scheduled to be removed and other maintenance level 1 roads, shall receive maintenance level 1 work as required by FSH 7709.58 and in full conformance with BMP 14.20.

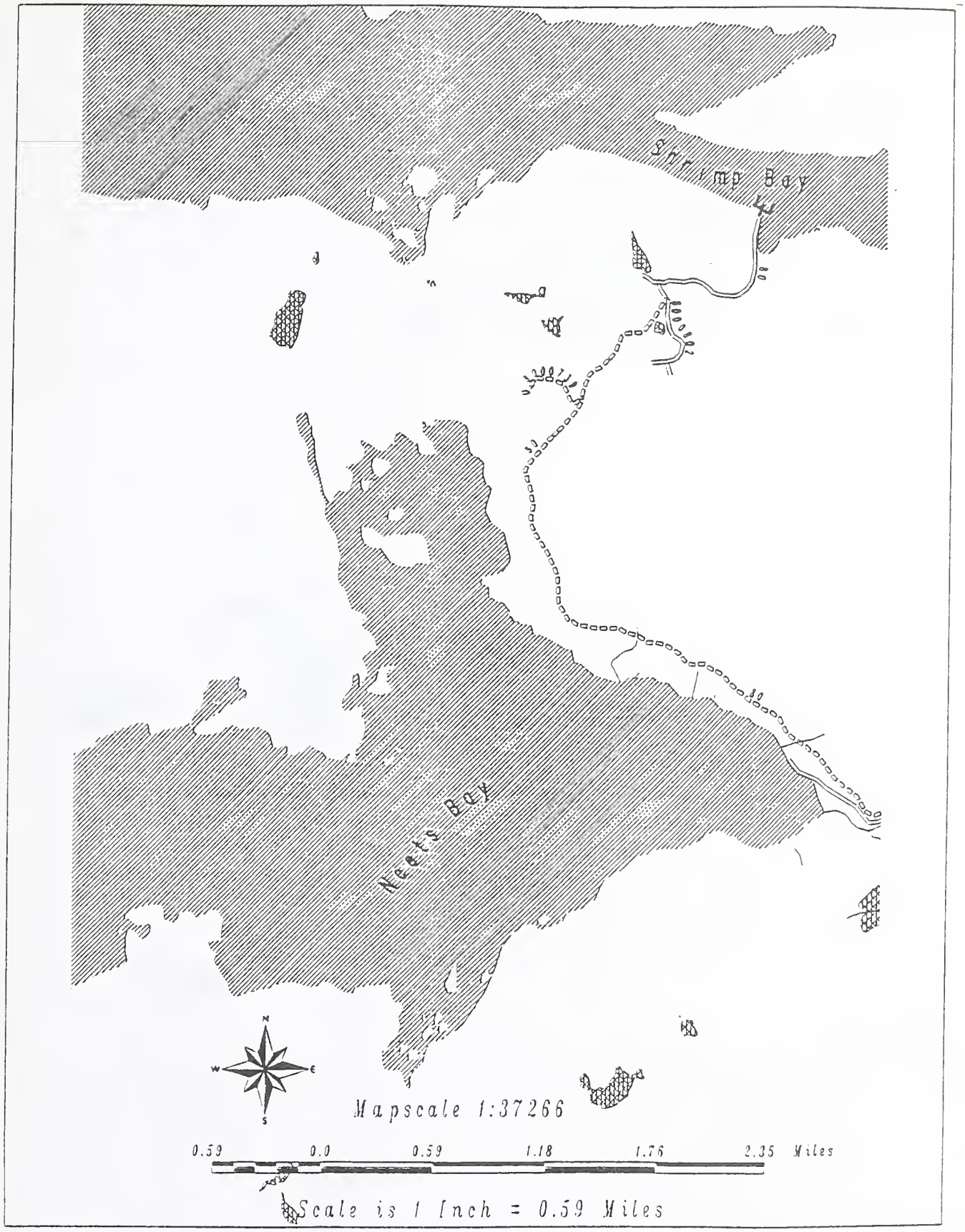
4. Maintenance level E indicates eliminating access. This requires removal of all drainage structures, scarifying the road prism and seeding the entire roadway. Roads that have E level maintenance will have drainage structures installed at designated streams only, no crossdrains.

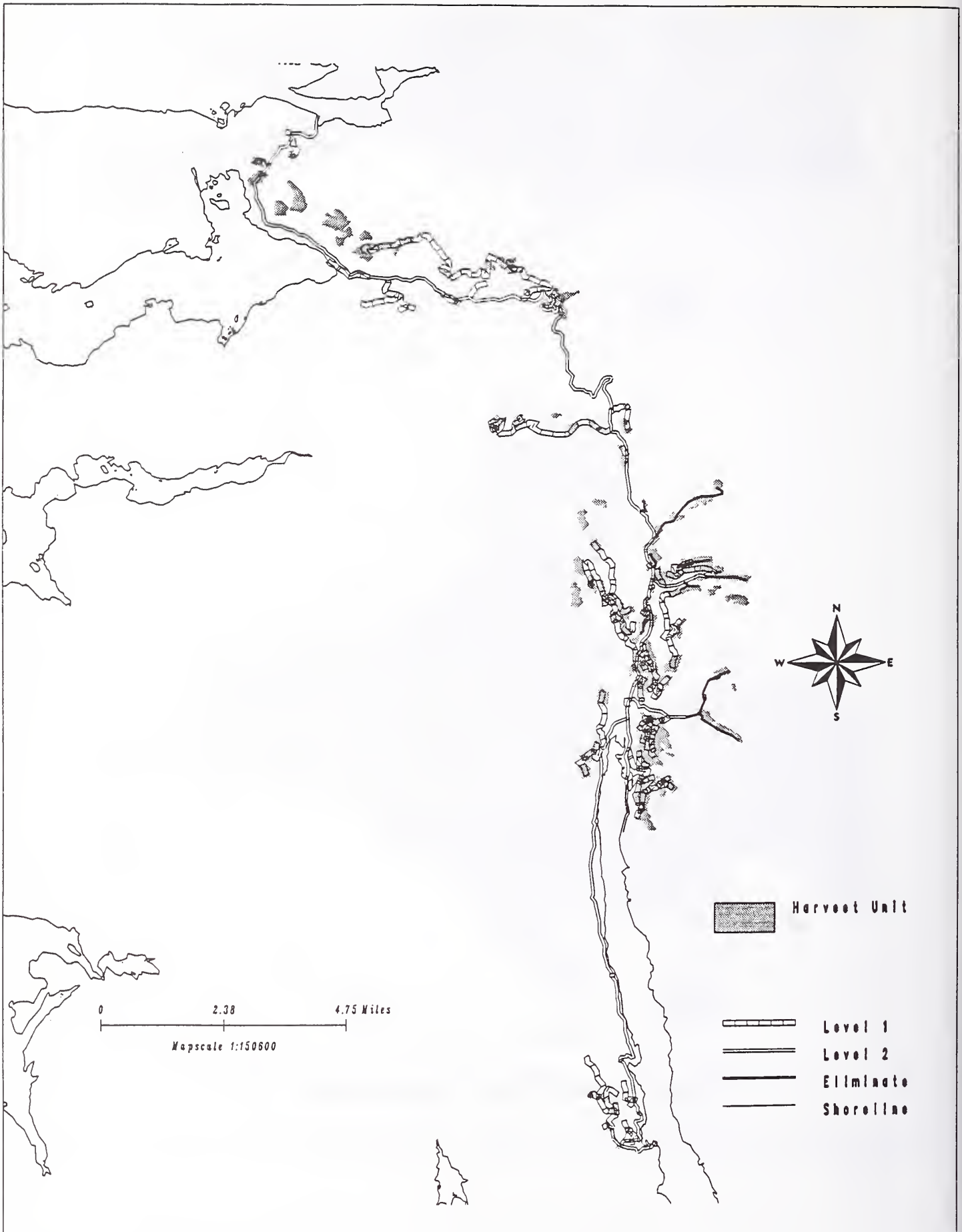

N
W
E
S
Carroll Inlet
Mapscale 1:35305
0.56
0.0
0.56
1.11
1.67
2.23 Miles
Scale is 1 Inch = 0.56 Miles


B337
B337100
B337
B340
B340100
B340105
N
S
E
W
Mapscale 1:23215
0.37
0.0
0.37
0.73
1.1
Miles
Scale is 1 Inch = 0.37 Miles


Shrimp Bay
B400900
B400920
B400900
84
84
84
N
W
E
S
Mapscale 1:37237
0.59
0.0
0.59
1.18
1.76
Miles
Scale is 1 Inch = 0.59 Miles


N
W
E
S
Mapscale 1:35031
0.55 0.0 0.55 1.11 1.66 2.21 Miles
Scale is 1 Inch = 0.55 Miles


Shrimp Bay
Neets Bay
N
W
E
S
Mapscale 1:37266
0.59
0.0
0.59
1.18
1.76
2.35 Miles
Scale is 1 Inch = 0.59 Miles



☆ U.S. GOVERNMENT PRINTING OFFICE: 1996 - 790-124 / 41907 REGION NO. 10


NATIONAL AGRICULTURAL LIBRARY
1022381542

The United States Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, and marital or familial status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means of communication of program information (braille, large print, audiotape, etc.) should contact the USDA Office of Communications at (202) 720-2791.

To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, DC 20250, or call (202) 720-7327 (voice) or (202) 720-1127 (TDD). USDA is an equal employment opportunity employer.



Federal Recycling Program
Printed on Recycled Paper

NATIONAL AGRICULTURAL LIBRARY
1022381542